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Patent
Attorney's Docket No. 005950-716

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of)
Dennis J. O'Rear) Group Art Unit: 1764
Application No.: 09/882,709) Examiner: Ellen M. McAvoy
Filed: June 15, 2001) Confirmation No.: 9362
For: Inhibiting Oxidation of a Fischer)
Tropsch Product Using Petroleum-)
Derived Products)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BRIEF FOR APPELLANT

Mail Stop Appeal Brief - Patent
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This appeal is from the decisions of the Examiner dated August 21, 2003 and December 8, 2003, finally rejecting claims 1 – 5 and 7 – 28, which are reproduced as Appendix A to this brief.

A check in the amount of \$330.00 is enclosed for the Government fee for the filing of this brief pursuant to 37 C.F.R. § 1.17 (c).

The Commissioner is hereby authorized to charge any appropriate fees that may be required by this paper, and to credit any overpayment, to Deposit Account No. 02-4800.

This brief is being submitted in triplicate.

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I. Real Party in Interest

The present application is assigned to Chevron U.S.A., a corporation organized and existing under the laws of the Commonwealth of Pennsylvania and having a regular and established place of business at San Ramon, California.

II. Related Appeals and Interferences

The Appellant's legal representative and assignee do not know of any other appeals or interferences that will affect or be directly affected by or have bearing on the Board's decision in the pending appeal.

III. Status of Claims

Claims 1 – 5 and 7 – 28 are pending in the present application. These claims are now under final rejection and Applicant hereby appeals the final rejection of claims 1 – 5, 7 – 25, and 28.

The application was originally filed with 27 claims. Claim 28 was added by an Amendment under 37 C.F.R. § 1.111 filed June 9, 2003. Pursuant to this amendment, claim 6 was canceled and claims 1, 9, 13, 18, 21, 26, and 27 were amended. Pursuant to an Amendment under 37 C.F.R. § 1.116 filed November 19, 2003, claims 9, 13, and 18 were further amended.

Pursuant to 37 C.F.R. § 1.191(a), Appellant hereby appeals the Examiner's decision finally rejecting claims 1 – 5, 7 – 25, and 28 to the Board of Patent Appeals and Interferences.

IV. Status of Amendments

A final Office Action was issued August 21, 2003, rejecting claims 1 – 5 and 7 – 28 under 35 U.S.C. § 103.

An Amendment under 37 C.F.R. § 1.116 was filed November 19, 2003, amending claims 9, 13, and 18. An Advisory Action was mailed December 8, 2003, indicating that the Amendment filed November 19, 2003, would be entered upon the

filing of an appeal. A Notice of Appeal was filed December 22, 2003, along with a request for a one month extension of time.

No further amendments have been made to the claims.

A copy of claims 1 – 5 and 7 – 28 is attached as Appendix A.

V. Summary of the Invention¹

The present invention relates to methods of inhibiting oxidation of a Fischer Tropsch product and blended hydrocarbonaceous products that resist oxidation. According to the present invention, it has been recognized that Fischer Tropsch products tend to have stability problems during shipment and storage. It has also been recognized that these stability problems occur because Fischer Tropsch products tend to oxidize relatively rapidly when exposed to air, and thus, Fischer Tropsch products are prone to oxidation during shipment and storage. (Page 7, Paragraph [0029]). In particular, the oxidative instability in Fischer Tropsch products has been linked to the formation of peroxides. The presently claimed methods and blended products address the increased need for effective antioxidants during shipment and storage of Fischer Tropsch products. (Page 7, Paragraph [0029]).

In one aspect, the presently claimed invention relates to methods of inhibiting oxidation of a Fischer Tropsch product comprising adding an effective amount of a petroleum-derived hydrocarbonaceous product to provide a blended product having a sulfur content of greater than 1 ppm and less than 100 ppm and a final peroxide number of less than 5 ppm after 7 days. In another aspect, the presently claimed invention relates to methods of inhibiting oxidation of a Fischer Tropsch product comprising adding an effective amount of a petroleum-derived hydrocarbonaceous product, which contains sulfur, to provide a blended product having a final peroxide number of less than 5 ppm after 7 days and processing the blended product with hydrogen to provide a final product with a sulfur content of less than 100 ppm.

In an additional aspect, the present invention relates to methods of inhibiting oxidation of a Fischer Tropsch product comprising creating a blended hydrocarbonaceous product by mixing (i) a Fischer Tropsch product, (ii) an effective

¹ This summary is provided in accordance with 37 C.F.R. § 1.192(c)(5) and is not intended to limit the subject matter of the claimed invention to the specific embodiments described herein.

amount of sulfur-containing petroleum-derived hydrocarbonaceous product, and (iii) an effective amount of an antioxidant selected from the group consisting of phenolic compounds, diphenylamine compounds, and combinations thereof. The blended product has a final peroxide number of less than 5 ppm after 7 days and the effective amount of antioxidant in (i) and (ii) is less than the amount that would be required in (i) alone. As the specification discloses, these phenolic and diphenylamine antioxidants are expensive and the presently claimed invention provides methods of inhibiting oxidation and blended products that resist oxidation and that require reduced amounts of these expensive antioxidants. (Page 2, Paragraph [0007]).

The presently claimed invention also relates to blended hydrocarbonaceous products comprising a Fischer Tropsch derived product, an effective amount of sulfur-containing petroleum-derived hydrocarbonaceous product; and an effective amount of an antioxidant selected from the group consisting of phenolic compounds, diphenylamine compounds, and combinations thereof. The blended product has a final peroxide number of less than 5 ppm after 7 days and the effective amount of antioxidant in (i) and (ii) is less than the amount that would be required in (i) alone.

The presently claimed invention further relates to blended hydrocarbonaceous products comprising a Fischer Tropsch derived product and an effective amount of a sulfur-containing petroleum-derived hydrocarbonaceous product such that the blended hydrocarbonaceous product has a final peroxide number of less than 5 ppm and has a sulfur content of greater than 1 ppm and less than 100 ppm.

According to the present invention, petroleum-derived hydrocarbonaceous products are desirable agents for inhibiting oxidation in the present invention due to their high compatibility with the Fischer Tropsch derived products. As a result of their high compatibility, the petroleum-derived product reside blended in the Fischer Tropsch products, and thus are particularly effective in inhibiting oxidation. (Page 13, Paragraph [0050]).

VI. The Issues

The issues presented on appeal are:

1. Whether claims 1 – 5, 7 – 25, and 28 are properly rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,080,301 (“Berlowitz ‘301”) or

U.S. Patent No. 6,165,949 ("Berlowitz '949") in combination with "Lubricant Additives," Section I – Chemistry of Additives, pages 1 – 11, 1967 ("Smalheer").

2. Whether claims 1 – 5, 7 – 25, and 28 are properly rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,332,974 ("Wittenbrink").

VII. Grouping of Claims

The claims do not stand or fall together. Claims 1 – 5 (Group I) stand or fall together. Claim 1 is independent. Claims 2 – 5 ultimately depend from claim 1. Claim 1 is representative of this group.

Claims 7 – 12 (Group II) stand or fall together independent of claim 1 as they include patentably distinct features. Claim 9 is independent. Claims 7 and 8 ultimately depend from claim 1, and claims 10 – 12 depend from claim 9. Claim 9 is representative of this group.

Claims 13 – 15 (Group III) stand or fall together independent of claim 1 as they include patentably distinct features. Claim 13 is independent; claims 14 and 15 depend from claim 13. Claim 13 is representative of this group.

Claims 16 and 17 (Group IV) stand or fall together independent of claim 1 as they include patentably distinct features. Claims 16 and 17 depend from claim 13. Claim 16 is representative of this group.

Claims 18 – 20 (Group V) stand or fall together independent of claim 1 as they include patentably distinct features. Claim 18 is independent; claims 19 and 20 depend from claim 18. Claim 18 is representative of this group.

Claims 21 – 25 and 28 (Group VI) stand or fall together independent of claim 1 as they include patentably distinct features. Claim 21 is independent; claims 22 – 25 and 28 depend from claim 21. Claim 21 is representative of this group.

VIII. Argument

A. The Invention

As discussed in section V, the present invention relates to a method of inhibiting oxidation of a Fischer Tropsch product and blended hydrocarbonaceous products that resist oxidation. According to the present invention, it has been

recognized that Fischer Tropsch products tend to have stability problems during shipment and storage. It has been recognized that these stability problems occur because Fischer Tropsch products tend to oxidize relatively rapidly when exposed to air, and thus, Fischer Tropsch products are prone to oxidation during shipment and storage. (Page 7, Paragraph [0029]). In particular, the oxidative instability in Fischer Tropsch products has been linked to the formation of peroxides. The presently claimed methods and blended products address the increased need for effective antioxidants during shipment and storage of Fischer Tropsch products. (Page 7, Paragraph [0029]).

Independent claim 1 recites a method of inhibiting oxidation of a Fischer Tropsch product. The method comprises synthesizing a Fischer Tropsch product and adding an effective amount of a petroleum-derived hydrocarbonaceous product to provide a blended product having a sulfur content of greater than 1 ppm and less than 100 ppm and having a final peroxide number of less than 5 ppm after 7 days. The petroleum-derived hydrocarbonaceous product is mixed into the Fischer Tropsch product to provide the blended product.

Independent claim 9 recited a method of inhibiting oxidation of a Fischer Tropsch product. The method comprises synthesizing a Fischer Tropsch product and adding an effective amount of a petroleum-derived hydrocarbonaceous product which contains sulfur to the Fischer Tropsch product. The petroleum-derived hydrocarbonaceous product is mixed into the Fischer Tropsch product to provide a blended product having a final peroxide number of less than 5 ppm after 7 days. The blended product is processed with hydrogen to provide a final product with a sulfur content of less than 100 ppm.

Independent claim 13 recites a method of inhibiting oxidation of a Fischer Tropsch product. The method comprises synthesizing a Fischer Tropsch product and creating a blended hydrocarbonaceous product by mixing (i) the Fischer Tropsch product, (ii) an effective amount of sulfur-containing petroleum-derived hydrocarbonaceous product, and (iii) an effective amount of an antioxidant selected from the group consisting of phenolic compounds, diphenylamine compounds, and combinations thereof, such that the blended hydrocarbonaceous product has a final peroxide number of less than 5 ppm after 7 days. The effective amount of antioxidant in (i) and (ii) is less than the amount that would be required in (i) alone.

Independent claim 18 recites a blended hydrocarbonaceous product comprising a Fischer Tropsch derived product; an effective amount of sulfur-containing petroleum-derived hydrocarbonaceous product; and an effective amount of an antioxidant selected from the group consisting of phenolic compounds, diphenylamine compounds, and combinations thereof, such that the blended hydrocarbonaceous product has a final peroxide number of less than 5 ppm. The effective amount of antioxidant is less than the amount that would be required a Fischer Tropsch derived product alone.

Independent claim 21 recites a blended hydrocarbonaceous product comprising a Fischer Tropsch derived product and an effective amount of a sulfur-containing petroleum-derived hydrocarbonaceous product such that the blended hydrocarbonaceous product has a final peroxide number of less than 5 ppm and has a sulfur content of greater than 1 ppm and less than 100 ppm.

B. The Cited Art

1. U.S. Patent No. 6,080,301 ("Berlowitz '301")

Berlowitz '301 relates to a premium synthetic lubricating oil base stock. The synthetic lubricating oil base stock of Berlowitz '301 is made by a Fischer Tropsch process. Berlowitz '301 discloses that the base stock may be blended with one or more base stocks selected from the group consisting of (a) a hydrocarbonaceous base stock, (b) a synthetic base stock, and mixtures thereof. (Col. 2, lines 30 – 33).

Berlowitz '301 discloses that by hydrocarbonaceous it is meant a primarily hydrocarbon type base stock derived from a conventional mineral oil, shale oil, tar, coal liquefaction, and mineral oil derived slack wax. (Col. 5, lines 6 – 10). Berlowitz '301 further discloses that typical examples of base stocks to be blended with the base stock of the invention include base stocks derived from PAO, mineral oil, mineral oil slack wax hydroisomerate, and mixtures thereof. (Col. 2, lines 33 – 36).

Berlowitz '301 discloses, and in the Examples demonstrates, that Fischer Tropsch derived base stocks are different, and most often *superior* to, lubricants formed of other base stocks. (Col. 2, lines 36 – 44). In the Examples, Berlowitz '301 tests the oxidation resistance or stability of the base stock without any additives along with the oxidation stability of a conventional mineral oil derived base stock (S150N).

(Example 1 at Col. 10, lines 34 – 47, Table 5, Example 2 and Table 6). *As tested by Berlowitz '301, the Fischer Tropsch base stock exhibits superior stability to the conventional base stock.* (Col. 10, lines 45 – 47, Table 5, and Table 6).

2. U.S. Patent No. 6,165,949 ("Berlowitz '949")

Berlowitz '949 relates to a wear resistant lubricant comprising at least 95 weight % non-cyclic isoparaffins derived from waxy, paraffinic Fischer Tropsch synthesized hydrocarbons in admixture with an effective amount of an antiwear additive wherein the antiwear additive is at least one of a metal phosphate, a metal dithiophosphate, a metal dialkylthiophosphate, a metal thiocarbamate, a metal dithiocarbamate, an ethoxylated amine dialkyldithiophosphate and an ethoxylate amine dithiobenzoate. Berlowitz '949 discloses that the amount of antiwear additive required to achieve a lubricant of a given level of wear resistance using a lubricant base stock derived from waxy Fischer Tropsch synthesized hydrocarbons is less than that required for a similar lubricating oil based on conventional petroleum oil. (Col. 1, lines 57 – 63). Berlowitz '949 further discloses that the Fischer Tropsch synthesized base stocks comprising the antiwear additives demonstrate wear protection superior to a conventional mineral oil derived base stock. (S150N) (Example 2, Table 4, and Table 5).

3. "Lubricant Additives," Section I – Chemistry of Additives, pages 1 – 11, 1967 ("Smalheer")

Smalheer provides a general discussion of lubricant additives. As such, Smalheer provides a summary of the chemistry of additives, including anti-oxidants.

4. U.S. Patent No. 6,332,974 ("Wittenbrink")

Wittenbrink relates to a wide-cut lubricant base stock made from a waxy Fischer Tropsch synthesized hydrocarbon fraction. Wittenbrink discloses that the Fischer Tropsch base stocks of the invention may be combined with conventional additive packages including antioxidants such as hindered phenols and hindered aromatic amines. Wittenbrink further discloses that the Fischer Tropsch base stocks of the invention may be blended with another base stock selected from the group consisting of (i) a hydrocarbonaceous base stock, (ii) a synthetic base stock, and

mixtures thereof. Wittenbrink discloses that the Fischer Tropsch base stocks of the invention will have superior properties to the blends. (Col. 4, lines 40 – 41). Wittenbrink tests certain properties of the Fischer Tropsch base stocks of the invention and compares these properties to those of a conventional lube oil fraction derived from petroleum oil. (Example 3). Wittenbrink concludes that the Fischer Tropsch base stocks of the invention have superior properties to those of the conventional lubricating oil. (Example 3). Wittenbrink provides no disclosure with regard to the oxidative stability of the lubricating oils.

C. The Claims of Group I

1. The Claims of Group I Would Not Have Been Obvious Over Berlowitz '301 or Berlowitz '949 in Combination With Smalheer

Group I, as defined herein, includes claims 1 – 5. As set forth above, claims 1 – 5 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Berlowitz '301 or Berlowitz '949 in combination with Smalheer.

Independent claim 1 recites a method of inhibiting oxidation of a Fischer Tropsch product. The method comprising synthesizing a Fischer Tropsch product and adding an effective amount of a petroleum-derived hydrocarbonaceous product to provide a blended product having a sulfur content of greater than 1 ppm and less than 100 ppm and having a final peroxide number of less than 5 ppm after 7 days. The petroleum-derived hydrocarbonaceous product is mixed into the Fischer Tropsch product to provide the blended product.

The claims of Group I are directed to methods of inhibiting oxidation during the shipment and storage of Fischer Tropsch products due to their tendency to oxidize rapidly when exposed to air. The presently claimed methods address the increased need for effective antioxidants during shipment and storage of Fischer Tropsch products due to formation of peroxides. According to the presently claimed methods, an effective amount of a petroleum-derived hydrocarbonaceous product is added to a Fischer Tropsch product to provide a blended product having a final peroxide number of less than 5 ppm after 7 days. The effective amount of petroleum-derived hydrocarbonaceous product improves the oxidation resistance of the Fischer Tropsch product and provides a blended product with superior oxidation resistance.

According to the present invention, petroleum-derived hydrocarbonaceous products are desirable agents for inhibiting oxidation in the present invention due to their high compatibility with the Fischer Tropsch derived products. As a result of their high compatibility, the petroleum-derived products reside blended in the Fischer Tropsch products, and thus are particularly effective in inhibiting oxidation. (Page 13, Paragraph [0050]).

Applicant respectfully submits that it is an important feature of the present invention that the method is for inhibiting oxidation of a Fischer Tropsch product. Applicant notes that preamble language can limit a claim if it recites not merely a context in which the invention may be used, but the essence of the invention without which performance of the recited steps is nothing but an academic exercise.

Boehringer Ingelheim Vetmedica Inc. v. Schering-Plough Corp., 65 USPQ2d 1961 (Fed. Cir. 2003), *citing Griffin v. Bertina*, 62 USPQ2d 1431 (Fed. Cir. 2002).

Applicant respectfully submits that the present preamble, reciting that the method is for inhibiting oxidation of a Fischer Tropsch product, recites the essence of the invention and thus provides a distinguishing feature.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine the reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. MPEP § 2143.

In the Office Action mailed August 21, 2003, the Examiner states that Berlowitz teaches blended products comprising Fischer Tropsch derived hydrocarbons blended with one or more base stocks. While recognizing that Berlowitz does not teach that oxidation may be inhibited in the Fischer Tropsch derived hydrocarbons by the addition of a conventional sulfur-containing mineral oil, the Examiner asserts that the skilled petroleum chemist would recognize the possible antioxidant effects of the sulfur-containing compounds. Thus, the Examiner asserts that the blended products of the invention appear to be the same as the blended products disclosed and claimed by Berlowitz and that the blended products of the prior art inherently have an antioxidant property.

Furthermore, recognizing that the sulfur content of the blended base stocks is not taught by Berlowitz, the Examiner states that this value can vary depending upon the sulfur content of the petroleum-derived hydrocarbonaceous products selected for blending, and upon the amount of hydrocarbonaceous products blended with the Fischer Tropsch products. Thus, the Examiner asserts that the skilled petroleum chemist can adjust various parameters to arrive at a specific sulfur-content of the blended product.

However, Berlowitz '301 and Berlowitz '949 do not disclose or suggest **methods of inhibiting oxidation** of a Fischer Tropsch product comprising adding an effective amount of a petroleum-derived hydrocarbonaceous product to provide a blended product having a sulfur content of greater than 1 ppm and less than 100 ppm and having a final peroxide number of less than 5 ppm after 7 days. In fact, Berlowitz '301 discloses that the oxidation resistance and stability of Fischer Tropsch products are superior to conventional base stocks. As such, Berlowitz '301 and Berlowitz '949 do not address any problems with stability of Fischer Tropsch products during shipment and storage; Berlowitz '301 and Berlowitz '949 do not recognize or address any instability of Fischer Tropsch products during shipment and storage, at least in part, due to the formation of peroxides; and Berlowitz '301 and Berlowitz '949 do not address inhibiting oxidation of the Fischer Tropsch product to overcome these problems. Since neither Berlowitz '301 nor Berlowitz '949 addresses instability, shipment and storage stability problems, inhibiting oxidation, or inhibiting formation of peroxides, neither Berlowitz '301 nor Berlowitz '949 discloses or suggests the presently claimed method of inhibiting oxidation of a Fischer Tropsch product. As such, Applicant respectfully submits that neither Berlowitz '301 nor Berlowitz '949 discloses or suggests a method of inhibiting oxidation of a Fischer Tropsch product comprising adding an effective amount of a petroleum-derived hydrocarbonaceous product to improve the oxidation resistance of a Fischer Tropsch product and to provide a blended product with superior oxidation resistance, in particular, to provide a blended product having a final peroxide number of less than 5 ppm after 7 days.

Furthermore, Applicant respectfully submits that obviousness cannot be predicated on what is not known at the time an invention is made, even if the inherency of a certain feature is later established. *In re Rijckaert*, 9 F.2d 1531, 28 USPQ2d 1955 (Fed. Cir. 1993). Applicant respectfully submits that neither

Berlowitz '301 nor Berlowitz '949 discloses or suggests any instability of Fischer Tropsch products during shipment and storage, at least in part, due to the formation of peroxides, and in fact, Berlowitz '301 discloses that the oxidation resistance and stability of Fischer Tropsch products was superior to conventional base stocks. Since neither Berlowitz '301 nor Berlowitz '949 recognizes the oxidative instability of Fischer Tropsch products and the resulting problems with shipment and storage stability, Applicant asserts that Berlowitz '301 and Berlowitz '949 cannot render the presently claimed methods for inhibiting oxidation obvious because obviousness cannot be predicated on what is not known at the time an invention is made.

Accordingly, Applicant respectfully submits that neither Berlowitz '301 nor Berlowitz '949 discloses or suggests the presently claimed methods of inhibiting oxidation of Fischer Tropsch products comprising adding an effective amount of a petroleum-derived hydrocarbonaceous product.

Smalheer merely discloses the chemistry of known lubricant additives, including anti-oxidants.

Accordingly, Applicant respectfully submits that even if there were some suggestion or motivation to combine Berlowitz '301 or Berlowitz '949 and Smalheer and a reasonable expectation of success, Berlowitz '301 or Berlowitz '949 and Smalheer, even when combined, do not disclose or suggest all the claim limitations. None of Berlowitz '301, Berlowitz '949, or Smalheer disclose or suggest a method of inhibiting oxidation of a Fischer Tropsch product comprising synthesizing a Fischer Tropsch product, adding an effective amount of a petroleum-derived hydrocarbonaceous product to provide a blended product having a sulfur content of greater than 1 ppm and less than 100 ppm and having a final peroxide number of less than 5 ppm after 7 days, and mixing the petroleum-derived hydrocarbonaceous product into the Fischer Tropsch product to provide the blended product.

Accordingly, Applicant respectfully submits that even when combined Berlowitz '301 or Berlowitz '949 in combination with Smalheer do not disclose or suggest all the claim limitations. Therefore, withdrawal of the rejection of claims 1 – 5 under 35 U.S.C. § 103(a) is respectfully requested.

2. The Claims of Group I Would Not Have Been Obvious Over Wittenbrink

As set forth above, claims 1 – 5 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Wittenbrink.

As described above, independent claim 1 recites a method of inhibiting oxidation of a Fischer Tropsch product. The method comprising synthesizing a Fischer Tropsch product and adding an effective amount of a petroleum-derived hydrocarbonaceous product to provide a blended product having a sulfur content of greater than 1 ppm and less than 100 ppm and having a final peroxide number of less than 5 ppm after 7 days. The petroleum-derived hydrocarbonaceous product is mixed into the Fischer Tropsch product to provide the blended product.

The claims of Group I are directed to methods of inhibiting oxidation during the shipment and storage of Fischer Tropsch products due to their tendency to oxidize rapidly when exposed to air. The presently claimed methods address the increased need for effective antioxidants during shipment and storage of Fischer Tropsch products due to formation of peroxides. According to the presently claimed methods, an effective amount of a petroleum-derived hydrocarbonaceous product is added to a Fischer Tropsch product to provide a blended product having a final peroxide number of less than 5 ppm after 7 days. The effective amount of petroleum-derived hydrocarbonaceous product improves the oxidation resistance of the Fischer Tropsch product and provides a blended product with superior oxidation resistance.

According to the present invention, petroleum-derived hydrocarbonaceous products are desirable agents for inhibiting oxidation in the present invention due to their high compatibility with the Fischer Tropsch derived products. As a result of their high compatibility, the petroleum-derived products reside blended in the Fischer Tropsch products, and thus are particularly effective in inhibiting oxidation. (Page 13, Paragraph [0050]).

Also as described above, Applicant respectfully submits that it is an important feature of the present invention that the method is for inhibiting oxidation of a Fischer Tropsch product. Applicant notes that preamble language can limit a claim if it recites not merely a context in which the invention may be used, but the essence of the invention without which performance of the recited steps is nothing but an academic exercise. *Boehringer Ingelheim Vetmedica Inc. v. Schering-Plough Corp.*, 65 USPQ2d 1961 (Fed. Cir. 2003), citing *Griffin v. Bertina*, 62 USPQ2d 1431 (Fed. Cir. 2002). Applicant respectfully submits that the present preamble, reciting that the

method is for inhibiting oxidation of a Fischer Tropsch product, recites the essence of the invention and thus provides a distinguishing feature.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine the reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. MPEP § 2143.

In the Office Action mailed August 12, 2003, the Examiner states that Wittenbrink teaches combining a Fischer Tropsch derived hydrocarbon fraction with a lubricant base stock such as conventional mineral oils, which contain sulfur. The Examiner asserts that the blended products inherently have an antioxidant property. Thus, the Examiner maintains the position that Wittenbrink meets the limitation of the claims.

However, Wittenbrink does not disclose or suggest *methods of inhibiting oxidation* of a Fischer Tropsch product comprising adding an effective amount of a petroleum-derived hydrocarbonaceous product to provide a blended product having a sulfur content of greater than 1 ppm and less than 100 ppm and having a final peroxide number of less than 5 ppm after 7 days. In fact, Wittenbrink discloses that the Fischer Tropsch base stocks of the invention have superior properties to those of the conventional lubricating oil. As such, Wittenbrink does not address any problems with stability of Fischer Tropsch products during shipment and storage; Wittenbrink does not recognize or address any instability of Fischer Tropsch products during shipment and storage, at least in part, due to the formation of peroxides; and Wittenbrink does not address inhibiting oxidation of the Fischer Tropsch product to overcome these problems. Since Wittenbrink does not address instability, shipment and storage stability problems, inhibiting oxidation, or inhibiting formation of peroxides, Wittenbrink does not disclose or suggest the presently claimed method of inhibiting oxidation of a Fischer Tropsch product. As such, Applicant respectfully submits that Wittenbrink does not disclose or suggest a method of inhibiting oxidation of a Fischer Tropsch product comprising adding an effective amount of a petroleum-derived hydrocarbonaceous product to improve the oxidation resistance of a Fischer Tropsch product and to provide a blended product with superior oxidation resistance,

in particular, to provide a blended product having a final peroxide number of less than 5 ppm after 7 days.

Furthermore, Applicant respectfully submits that obviousness cannot be predicated on what is not known at the time an invention is made, even if the inherency of a certain feature is later established. *In re Rijckaert*, 9 F.2d 1531, 28 USPQ2d 1955 (Fed. Cir. 1993). Applicant respectfully submits that Wittenbrink does not disclose or suggest any instability of Fischer Tropsch products during shipment and storage, at least in part, due to the formation of peroxides, and in fact, Wittenbrink discloses that the Fischer Tropsch base stocks of the invention have superior properties to those of the conventional lubricating oil. Since Wittenbrink does not recognize the oxidative instability of Fischer Tropsch products and the resulting problems with shipment and storage stability, Applicant asserts that Wittenbrink cannot render the presently claimed methods for inhibiting oxidation obvious because obviousness cannot be predicated on what is not known at the time an invention is made.

Accordingly, since Wittenbrink does not disclose or suggest a method of inhibiting the oxidation of Fischer Tropsch products comprising adding an effective amount of sulfur-containing petroleum-derived hydrocarbonaceous product, Applicant respectfully submits that Wittenbrink does not disclose or suggest all of the claim limitations and withdrawal of the rejection of claims 1 – 5 under 35 U.S.C. § 103(a) is respectfully requested.

D. The Claims of Group II

1. The Claims of Group II Would Not Have Been Obvious Over Berlowitz '301 or Berlowitz '949 in Combination With Smalheer

Group II, as defined herein, includes claims 7 – 12. As set forth above, claims 7 – 12 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Berlowitz '301 or Berlowitz '949 in combination with Smalheer.

Independent claim 9 recited a method of inhibiting oxidation of a Fischer Tropsch product. The method comprising synthesizing a Fischer Tropsch product and adding an effective amount of a petroleum-derived hydrocarbonaceous product which contains sulfur to the Fischer Tropsch product. The petroleum-derived

hydrocarbonaceous product is mixed into the Fischer Tropsch product to provide a blended product having a final peroxide number of less than 5 ppm after 7 days. The blended product is processed with hydrogen to provide a final product with a sulfur content of less than 100 ppm.

The claims of Group II are directed to methods of inhibiting oxidation during the shipment and storage of Fischer Tropsch products due to their tendency to oxidize rapidly when exposed to air. The presently claimed methods address the increased need for effective antioxidants during shipment and storage of Fischer Tropsch products due to formation of peroxides. According to the presently claimed methods, an effective amount of a petroleum-derived hydrocarbonaceous product is added to a Fischer Tropsch product provide a blended product having a final peroxide number of less than 5 ppm after 7 days. The effective amount of petroleum-derived hydrocarbonaceous product improves the oxidation resistance of the Fischer Tropsch product and provides a blended product with superior oxidation resistance.

According to the present invention, petroleum-derived hydrocarbonaceous products are desirable agents for inhibiting oxidation in the present invention due to their high compatibility with the Fischer Tropsch derived products. As a result of their high compatibility, the petroleum-derived products reside blended in the Fischer Tropsch products, and thus are particularly effective in inhibiting oxidation. (Page 13, Paragraph [0050]).

Applicant respectfully submits that it is an important feature of the present invention that the method is for inhibiting oxidation of a Fischer Tropsch product. Applicant notes that preamble language can limit a claim if it recites not merely a context in which the invention may be used, but the essence of the invention without which performance of the recited steps is nothing but an academic exercise.

Boehringer Ingelheim Vetmedica Inc. v. Schering-Plough Corp., 65 USPQ2d 1961 (Fed. Cir. 2003), *citing Griffin v. Bertina*, 62 USPQ2d 1431 (Fed. Cir. 2002).

Applicant respectfully submits that the present preamble, reciting that the method is for inhibiting oxidation of a Fischer Tropsch product, recites the essence of the invention and thus provides a distinguishing feature.

Moreover, the claims of Group II recite processing the blended product with hydrogen or hydrotreating the blended product. According to the invention, a desirable property of Fischer Tropsch products is that they contain essentially no

aromatics or heteroatoms, such as sulfur and nitrogen. However, the petroleum-derived hydrocarbonaceous products, added to the Fischer Tropsch products to inhibit oxidation, may add impurities, aromatics, and unwanted heteroatoms (such as sulfur and nitrogen), and the resulting blended product may contain impurities, aromatics, and unwanted heteroatoms that the original Fischer Tropsch product did not contain. Therefore, after the period in which oxidation is to be prevented and before the Fischer Tropsch liquid products are to be sold/used, it is desirable to remove or at least reduce the impurities, aromatics, and unwanted heteroatoms (such as sulfur, nitrogen, metals). The impurities, aromatics, and heteroatom content are reduced by processing the blended product with hydrogen, in particular hydrotreating. (Page 15, Paragraphs [0058] and [0059]).

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine the reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. MPEP § 2143.

Applicant respectfully submits that Berlowitz '301 and Berlowitz '949 do not disclose or suggest *methods of inhibiting oxidation* of a Fischer Tropsch product comprising adding an effective amount of a petroleum-derived hydrocarbonaceous product to provide a blended product having a final peroxide number of less than 5 ppm after 7 days. In fact, Berlowitz '301 discloses that the oxidation resistance and stability of Fischer Tropsch products are superior to conventional base stocks. As such, Berlowitz '301 and Berlowitz '949 do not address any problems with stability of Fischer Tropsch products during shipment and storage; Berlowitz '301 and Berlowitz '949 do not recognize or address any instability of Fischer Tropsch products during shipment and storage, at least in part, due to the formation of peroxides; and Berlowitz '301 and Berlowitz '949 do not address inhibiting oxidation of the Fischer Tropsch product to overcome these problems. Since neither Berlowitz '301 nor Berlowitz '949 addresses instability, shipment and storage stability problems, inhibiting oxidation, or inhibiting formation of peroxides, neither Berlowitz '301 nor Berlowitz '949 discloses or suggests the presently claimed method of inhibiting oxidation of a Fischer Tropsch product. As such, Applicant respectfully submits that

neither Berlowitz '301 nor Berlowitz '949 discloses or suggests a method of inhibiting oxidation of a Fischer Tropsch product comprising adding an effective amount of a petroleum-derived hydrocarbonaceous product to improve the oxidation resistance of a Fischer Tropsch product and to provide a blended product with superior oxidation resistance, in particular, to provide a blended product having a final peroxide number of less than 5 ppm after 7 days.

Applicant further respectfully submits that Berlowitz '301 and Berlowitz '949 merely disclose that in some cases one or more additional base stocks may be mixed with, added to or blended with one or more of the Fischer Tropsch derived base stocks to provide fully formulated lube oils comprising this blend. Berlowitz '301 and Berlowitz '949 do not address the additional base stocks may add impurities, aromatics, and unwanted heteroatoms (such as sulfur and nitrogen) to the Fischer Tropsch derived base stocks, which otherwise would not contain these species. As such, Applicant respectfully submits that Berlowitz '301 and Berlowitz '949 do not disclose or suggest processing the blended product with hydrogen.

Moreover, as described above Berlowitz '301 and Berlowitz '949 do not disclose or suggest the presently claimed methods of inhibiting oxidation of a Fischer Tropsch product comprising adding an effective amount of a petroleum-derived hydrocarbonaceous product to provide a blended product. Since Berlowitz '301 and Berlowitz '949 do not disclose or suggest inhibiting oxidation and do not disclose or suggest mixing the one or more additional base stocks to inhibit oxidation, Applicant further respectfully submits that Berlowitz '301 and Berlowitz '949 do not disclose or suggest processing the blended product with hydrogen to remove at least a portion of sulfur and other impurities that originate from the petroleum-derived product after the period in which oxidation is to be prevented and/or to provide a final product with a sulfur content of less than 100 ppm. As described above, it is desirable that the Fischer Tropsch products and the blended products comprising the Fischer Tropsch products contain essentially no aromatics or heteroatoms, such as sulfur and nitrogen; therefore, after the period in which oxidation is to be prevented and before the Fischer Tropsch liquid products are to be sold/used, the impurities (i.e., aromatics, heteroatoms) are removed or at least reduced.

Furthermore, Applicant respectfully submits that obviousness cannot be predicated on what is not known at the time an invention is made, even if the

inherency of a certain feature is later established. *In re Rijckaert*, 9 F.2d 1531, 28 USPQ2d 1955 (Fed. Cir. 1993). Applicant respectfully submits that neither Berlowitz '301 nor Berlowitz '949 discloses or suggests any instability of Fischer Tropsch products during shipment and storage, at least in part, due to the formation of peroxides, and in fact, Berlowitz '301 discloses that the oxidation resistance and stability of Fischer Tropsch products was superior to conventional base stocks. Since Berlowitz '301 and Berlowitz '949 do not recognize the oxidative instability of Fischer Tropsch products and the resulting problems with storage stability, Applicant asserts that Berlowitz '301 and Berlowitz '949 cannot render the presently claimed methods for inhibiting oxidation obvious because obviousness cannot be predicated on what is not known at the time an invention is made.

Accordingly, Applicant respectfully submits that neither Berlowitz '301 nor Berlowitz '949 discloses or suggests the presently claimed methods of inhibiting oxidation of Fischer Tropsch products comprising adding an effective amount of a petroleum-derived hydrocarbonaceous product. Applicant further respectfully submits that neither Berlowitz '301 nor Berlowitz '949 discloses or suggests the presently claimed methods of inhibiting oxidation of Fischer Tropsch products comprising processing the blended product with hydrogen.

Smalheer merely discloses the chemistry of known lubricant additives, including anti-oxidants.

Accordingly, Applicant respectfully submits that even if there were some suggestion or motivation to combine Berlowitz '301 or Berlowitz '949 and Smalheer and a reasonable expectation of success, Berlowitz '301 or Berlowitz '949 and Smalheer, even when combined, do not disclose or suggest all the claim limitations. None of Berlowitz '301, Berlowitz '949, or Smalheer disclose or suggest a method of inhibiting oxidation of a Fischer Tropsch product comprising synthesizing a Fischer Tropsch product, adding an effective amount of a petroleum-derived hydrocarbonaceous product to provide a blended product, mixing the petroleum-derived hydrocarbonaceous product into the Fischer Tropsch product to provide a blended product having a final peroxide number of less than 5 ppm after 7 days, and processing the blended product with hydrogen.

Accordingly, Applicant respectfully submits that even when combined Berlowitz '301 or Berlowitz '949 in combination with Smalheer do not disclose or

suggest all the claim limitations. Therefore, withdrawal of the rejection of claims 7 – 12 under 35 U.S.C. § 103(a) is respectfully requested.

2. The Claims of Group II Would Not Have Been Obvious Over Wittenbrink

As set forth above, claims 7 – 12 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Wittenbrink.

As described above, independent claim 9 recited a method of inhibiting oxidation of a Fischer Tropsch product. The method comprising synthesizing a Fischer Tropsch product and adding an effective amount of a petroleum-derived hydrocarbonaceous product which contains sulfur to the Fischer Tropsch product. The petroleum-derived hydrocarbonaceous product is mixed into the Fischer Tropsch product to provide a blended product having a final peroxide number of less than 5 ppm after 7 days. The blended product is processed with hydrogen to provide a final product with a sulfur content of less than 100 ppm.

The claims of Group II are directed to methods of inhibiting oxidation during the shipment and storage of Fischer Tropsch products due to their tendency to oxidize rapidly when exposed to air. The presently claimed methods address the increased need for effective antioxidants during shipment and storage of Fischer Tropsch products due to formation of peroxides. According to the presently claimed methods, an effective amount of a petroleum-derived hydrocarbonaceous product is added to a Fischer Tropsch product to provide a blended product having a final peroxide number of less than 5 ppm after 7 days. The effective amount of petroleum-derived hydrocarbonaceous product improves the oxidation resistance of the Fischer Tropsch product and provides a blended product with superior oxidation resistance.

According to the present invention, petroleum-derived hydrocarbonaceous products are desirable agents for inhibiting oxidation in the present invention due to their high compatibility with the Fischer Tropsch derived products. As a result of their high compatibility, the petroleum-derived products reside blended in the Fischer Tropsch products, and thus are particularly effective in inhibiting oxidation. (Page 13, Paragraph [0050]).

Applicant respectfully submits that it is an important feature of the present invention that the method is for inhibiting oxidation of a Fischer Tropsch product.

Applicant notes that preamble language can limit a claim if it recites not merely a context in which the invention may be used, but the essence of the invention without which performance of the recited steps is nothing but an academic exercise.

Boehringer Ingelheim Vetmedica Inc. v. Schering-Plough Corp., 65 USPQ2d 1961 (Fed. Cir. 2003), *citing Griffin v. Bertina*, 62 USPQ2d 1431 (Fed. Cir. 2002).

Applicant respectfully submits that the present preamble, reciting that the method is for inhibiting oxidation of a Fischer Tropsch product, recites the essence of the invention and thus provides a distinguishing feature.

Moreover, the claims of Group II recite processing the blended product with hydrogen or hydrotreating the blended product. According to the invention, a desirable property of Fischer Tropsch products is that they contain essentially no aromatics or heteroatoms, such as sulfur and nitrogen. However, the petroleum-derived hydrocarbonaceous products, added to the Fischer Tropsch products to inhibit oxidation, may add impurities, aromatics, and unwanted heteroatoms (such as sulfur and nitrogen), and the resulting blended product may contain impurities, aromatics, and unwanted heteroatoms that the original Fischer Tropsch product did not contain. Therefore, after the period in which oxidation is to be prevented and before the Fischer Tropsch liquid products are to be sold/used, it may be desirable to remove or at least reduce the impurities, aromatics, and unwanted heteroatoms (such as sulfur, nitrogen, metals). The impurities, aromatics, and heteroatom content may be reduced by processing the blended product with hydrogen, in particular hydrotreating. (Page 15, Paragraphs [0058] and [0059]).

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine the reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. MPEP § 2143.

Wittenbrink does not disclose or suggest *methods of inhibiting oxidation* of a Fischer Tropsch product comprising adding an effective amount of a petroleum-derived hydrocarbonaceous product to provide a blended product having a final peroxide number of less than 5 ppm after 7 days. In fact, Wittenbrink discloses that the Fischer Tropsch base stocks of the invention have superior properties to those of

the conventional lubricating oil. As such, Wittenbrink does not addresses any problems with stability of Fischer Tropsch products during shipment and storage; Wittenbrink does not recognize or address any instability of Fischer Tropsch products during shipment and storage, at least in part, due to the formation of peroxides; and Wittenbrink does not address inhibiting oxidation of the Fischer Tropsch product to overcome these problems. Since Wittenbrink does not address instability, shipment and storage stability problems, inhibiting oxidation, or inhibiting formation of peroxides, Wittenbrink does not disclose or suggest the presently claimed method of inhibiting oxidation of a Fischer Tropsch product. As such, Applicant respectfully submits that Wittenbrink does not disclose or suggest a method of inhibiting oxidation of a Fischer Tropsch product comprising adding an effective amount of a petroleum-derived hydrocarbonaceous product to improve the oxidation resistance of a Fischer Tropsch product and to provide a blended product with superior oxidation resistance, in particular, to provide a blended product having a final peroxide number of less than 5 ppm after 7 days.

Applicant further respectfully submits that Wittenbrink merely disclose that in some cases one or more additional base stocks may be mixed with, added to or blended with one or more of the Fischer Tropsch derived base stocks to provide fully formulated lube oils comprising this blend. Wittenbrink does not address that the additional base stocks may add impurities, aromatics, and unwanted heteroatoms (such as sulfur and nitrogen) to the Fischer Tropsch derived base stocks, which otherwise would not contain these species. As such, Wittenbrink does not disclose or suggest processing the blended product with hydrogen.

Moreover, as described above Wittenbrink does not disclose or suggest the presently claimed methods of inhibiting oxidation of a Fischer Tropsch product comprising adding an effective amount of a petroleum-derived hydrocarbonaceous product to provide a blended product. Since Wittenbrink does not disclose or suggest inhibiting oxidation and does not disclose or suggest mixing the one or more additional base stocks to inhibit oxidation, Applicant further respectfully submits that Wittenbrink does not disclose or suggest processing the blended product with hydrogen to remove at least a portion of sulfur and other impurities that originate from the petroleum-derived product after the period in which oxidation is to be prevented and/or to provide a final product with a sulfur content of less than 100 ppm.

As described above, it is desirable that the Fischer Tropsch products and the blended products comprising the Fischer Tropsch products contain essentially no aromatics or heteroatoms, such as sulfur and nitrogen; therefore, after the period in which oxidation is to be prevented and before the Fischer Tropsch liquid products are to be sold/used, the impurities (i.e., aromatics, heteroatoms) are removed or at least reduced.

Furthermore, Applicant respectfully submits that obviousness cannot be predicated on what is not known at the time an invention is made, even if the inherency of a certain feature is later established. *In re Rijckaert*, 9 F.2d 1531, 28 USPQ2d 1955 (Fed. Cir. 1993). Applicant respectfully submits that Wittenbrink does not disclose or suggest any instability of Fischer Tropsch products during shipment and storage, at least in part, due to the formation of peroxides, and in fact, Wittenbrink discloses that the Fischer Tropsch base stocks of the invention have superior properties to those of the conventional lubricating oil. Since Wittenbrink does not recognize the oxidative instability of Fischer Tropsch products and the resulting problems with storage stability, Applicant asserts that Wittenbrink cannot render the presently claimed methods for inhibiting oxidation obvious because obviousness cannot be predicated on what is not known at the time an invention is made.

Accordingly, Applicant respectfully submits that Wittenbrink does not disclose or suggest all the claim limitations. Wittenbrink does not disclose or suggest a method of inhibiting oxidation of a Fischer Tropsch product comprising synthesizing a Fischer Tropsch product, adding an effective amount of a petroleum-derived hydrocarbonaceous product to provide a blended product, mixing the petroleum-derived hydrocarbonaceous product into the Fischer Tropsch product to provide a blended product having a final peroxide number of less than 5 ppm after 7 days, and processing the blended product with hydrogen. Therefore, withdrawal of the rejection of claims 7 – 12 under 35 U.S.C. § 103(a) is respectfully requested.

E. The Claims of Group III

1. The Claims of Group III Would Not Have Been Obvious Over Berlowitz '301 or Berlowitz '949 in Combination With Smalheer

Group III, as defined herein, includes claims 13 – 15. As set forth above, claims 13 – 15 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Berlowitz '301 or Berlowitz '949 in combination with Smalheer.

Independent claim 13 recites a method of inhibiting oxidation of a Fischer Tropsch product. The method comprises synthesizing a Fischer Tropsch product and creating a blended hydrocarbonaceous product by mixing (i) the Fischer Tropsch product, (ii) an effective amount of sulfur-containing petroleum-derived hydrocarbonaceous product, and (iii) an effective amount of an antioxidant selected from the group consisting of phenolic compounds, diphenylamine compounds, and combinations thereof, such that the blended hydrocarbonaceous product has a final peroxide number of less than 5 ppm after 7 days. The effective amount of antioxidant in (i) and (ii) is less than the amount that would be required in (i) alone.

The claims of Group III are directed to methods of inhibiting oxidation during the shipment and storage of Fischer Tropsch products due to their tendency to oxidize rapidly when exposed to air. The presently claimed methods address the increased need for effective antioxidants during shipment and storage of Fischer Tropsch products due to formation of peroxides. According to the presently claimed methods, an effective amount of sulfur-containing petroleum-derived hydrocarbonaceous product and an effective amount of an antioxidant selected from the group consisting of phenolic compounds, diphenylamine compounds, and combinations thereof, are mixed with a Fischer Tropsch product, such that the blended hydrocarbonaceous product has a final peroxide number of less than 5 ppm after 7 days and wherein the effective amount of antioxidant in the Fischer Tropsch product mixed with the sulfur-containing petroleum-derived hydrocarbonaceous product is less than the amount that would be required in the Fischer Tropsch product alone. These phenolic and diphenylamine antioxidants are expensive; therefore, it is desirable that lower levels of these expensive antioxidants are required. (Page 2, Paragraph [0007]).

Applicant respectfully submits that it is an important feature of the present invention that the method is for inhibiting oxidation of a Fischer Tropsch product. Applicant notes that preamble language can limit a claim if it recites not merely a

context in which the invention may be used, but the essence of the invention without which performance of the recited steps is nothing but an academic exercise.

Boehringer Ingelheim Vetmedica Inc. v. Schering-Plough Corp., 65 USPQ2d 1961 (Fed. Cir. 2003), *citing Griffin v. Bertina*, 62 USPQ2d 1431 (Fed. Cir. 2002).

Applicant respectfully submits that the present preamble, reciting that the method is for inhibiting oxidation of a Fischer Tropsch product, recites the essence of the invention and thus provides a distinguishing feature.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine the reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. MPEP § 2143.

Applicant respectfully submits that Berlowitz '301 and Berlowitz '949 do not disclose or suggest *methods of inhibiting oxidation* of a Fischer Tropsch product comprising creating a blended hydrocarbonaceous product by mixing (i) a Fischer Tropsch product (ii) an effective amount of a sulfur-containing petroleum-derived hydrocarbonaceous product, and (iii) an effective amount of an antioxidant selected from the group consisting of phenolic compounds, diphenylamine compounds, and combinations thereof, such that the blended product has a final peroxide number of less than 5 ppm after 7 days and wherein the effective amount of antioxidant in (i) and (ii) is less than the amount that would be required in (i) alone.

In fact, Berlowitz '301 discloses that the oxidation resistance and stability of Fischer Tropsch products are superior to conventional base stocks. As such, Berlowitz '301 and Berlowitz '949 do not address any problems with stability of Fischer Tropsch products during shipment and storage; Berlowitz '301 and Berlowitz '949 do not recognize or address any instability of Fischer Tropsch products during shipment and storage, at least in part, due to the formation of peroxides; and Berlowitz '301 and Berlowitz '949 do not address inhibiting oxidation of the Fischer Tropsch product to overcome these problems. Since neither Berlowitz '301 nor Berlowitz '949 addresses instability, shipment and storage stability problems, inhibiting oxidation, or inhibiting formation of peroxides, neither Berlowitz '301 nor

Berlowitz '949 discloses or suggests the presently claimed method of inhibiting oxidation of a Fischer Tropsch product.

In addition, since Berlowitz '301 discloses that the oxidation resistance and stability of Fischer Tropsch products are superior to conventional base stocks, Berlowitz "teaches way" from the effective amount of conventional antioxidant required in a blend of a Fischer Tropsch product and a conventional base stock being less than the amount required in a Fischer Tropsch product alone. Applicant respectfully submits that a prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention, and a prior art reference that "teaches away" from the claimed invention is a significant factor to be considered in determining obviousness. *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984). Since Berlowitz "teaches away" from the effective amount of conventional antioxidant required in a blend of a Fischer Tropsch product and a conventional base stock being less than the amount required in a Fischer Tropsch product alone, Applicant respectfully submits that Berlowitz cannot disclose or suggest the presently claimed methods.

As such, Applicant respectfully submits that neither Berlowitz '301 nor Berlowitz '949 discloses or suggests a method of inhibiting oxidation of a Fischer Tropsch product comprising creating a blended hydrocarbonaceous product by mixing (i) a Fischer Tropsch product (ii) an effective amount of a sulfur-containing petroleum-derived hydrocarbonaceous product, and (iii) an effective amount of an antioxidant selected from the group consisting of phenolic compounds, diphenylamine compounds, and combinations thereof, such that the blended product has a final peroxide number of less than 5 ppm after 7 days and wherein the effective amount of antioxidant in (i) and (ii) is less than the amount that would be required in (i) alone.

Furthermore, Applicant respectfully submits that obviousness cannot be predicated on what is not known at the time an invention is made, even if the inherency of a certain feature is later established. *In re Rijckaert*, 9 F.2d 1531, 28 USPQ2d 1955 (Fed. Cir. 1993). Applicant respectfully submits that neither Berlowitz '301 nor Berlowitz '949 discloses or suggests any instability of Fischer Tropsch products during shipment and storage, at least in part, due to the formation of peroxides, and in fact, Berlowitz '301 discloses that the oxidation resistance and

stability of Fischer Tropsch products was superior to conventional base stocks. Since neither Berlowitz '301 nor Berlowitz '949 recognizes the oxidative instability of Fischer Tropsch products and the resulting problems with storage stability, Applicant asserts that Berlowitz '301 and Berlowitz '949 cannot render the presently claimed methods for inhibiting oxidation obvious because obviousness cannot be predicated on what is not known at the time an invention is made.

Accordingly, Applicant respectfully submits that neither Berlowitz '301 nor Berlowitz '949 discloses or suggests the presently claimed methods of inhibiting oxidation of Fischer Tropsch products comprising creating a blended hydrocarbonaceous product by mixing (i) a Fischer Tropsch product (ii) an effective amount of a sulfur-containing petroleum-derived hydrocarbonaceous product, and (iii) an effective amount of an antioxidant selected from the group consisting of phenolic compounds, diphenylamine compounds, and combinations thereof, such that the blended product has a final peroxide number of less than 5 ppm after 7 days and wherein the effective amount of antioxidant in (i) and (ii) is less than the amount that would be required in (i) alone.

Smalheer merely discloses the chemistry of known lubricant additives, including anti-oxidants.

Accordingly, Applicant respectfully submits that even if there were some suggestion or motivation to combine Berlowitz '301 or Berlowitz '949 and Smalheer and a reasonable expectation of success, Berlowitz '301 or Berlowitz '949 and Smalheer, even when combined, do not disclose or suggest all the claim limitations. None of Berlowitz '301, Berlowitz '949, or Smalheer disclose or suggest a method of inhibiting oxidation of a Fischer Tropsch product comprising synthesizing a Fischer Tropsch product; and creating a blended hydrocarbonaceous product by mixing (i) a Fischer Tropsch product (ii) an effective amount of a sulfur-containing petroleum-derived hydrocarbonaceous product, and (iii) an effective amount of an antioxidant selected from the group consisting of phenolic compounds, diphenylamine compounds, and combinations thereof, such that the blended product has a final peroxide number of less than 5 ppm after 7 days and wherein the effective amount of antioxidant in (i) and (ii) is less than the amount that would be required in (i) alone.

Accordingly, Applicant respectfully submits that even when combined Berlowitz '301 and Berlowitz '949 in combination with Smalheer do not disclose or

suggest all the claim limitations and withdrawal of the rejection of claims 13 – 15 under 35 U.S.C. § 103(a) is respectfully requested.

2. The Claims of Group III Would Not Have Been Obvious Over Wittenbrink

As set forth above, claims 13 – 15 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Wittenbrink.

As described above, independent claim 13 recites a method of inhibiting oxidation of a Fischer Tropsch product. The method comprises synthesizing a Fischer Tropsch product and creating a blended hydrocarbonaceous product by mixing (i) the Fischer Tropsch product, (ii) an effective amount of sulfur-containing petroleum-derived hydrocarbonaceous product, and (iii) an effective amount of an antioxidant selected from the group consisting of phenolic compounds, diphenylamine compounds, and combinations thereof, such that the blended hydrocarbonaceous product has a final peroxide number of less than 5 ppm after 7 days. The effective amount of antioxidant in (i) and (ii) is less than the amount that would be required in (i) alone.

The claims of Group III are directed to methods of inhibiting oxidation during the shipment and storage of Fischer Tropsch products due to their tendency to oxidize rapidly when exposed to air. The presently claimed methods address the increased need for effective antioxidants during shipment and storage of Fischer Tropsch products due to formation of peroxides. According to the presently claimed methods, an effective amount of sulfur-containing petroleum-derived hydrocarbonaceous product and an effective amount of an antioxidant selected from the group consisting of phenolic compounds, diphenylamine compounds, and combinations thereof, are mixed with a Fischer Tropsch product, such that the blended hydrocarbonaceous product has a final peroxide number of less than 5 ppm after 7 days and wherein the effective amount of antioxidant in the Fischer Tropsch product mixed with the sulfur-containing petroleum-derived hydrocarbonaceous product is less than the amount that would be required in the Fischer Tropsch product alone. These phenolic and diphenylamine antioxidants are expensive; therefore, it is desirable that lower levels of these expensive antioxidants are required. (Page 2, Paragraph [0007]).

Applicant respectfully submits that it is an important feature of the present invention that the method is for inhibiting oxidation of a Fischer Tropsch product. Applicant notes that preamble language can limit a claim if it recites not merely a context in which the invention may be used, but the essence of the invention without which performance of the recited steps is nothing but an academic exercise.

Boehringer Ingelheim Vetmedica Inc. v. Schering-Plough Corp., 65 USPQ2d 1961 (Fed. Cir. 2003), *citing Griffin v. Bertina*, 62 USPQ2d 1431 (Fed. Cir. 2002).

Applicant respectfully submits that the present preamble, reciting that the method is for inhibiting oxidation of a Fischer Tropsch product, recites the essence of the invention and thus provides a distinguishing feature.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine the reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. MPEP § 2143.

Applicant respectfully submits that Wittenbrink does not disclose or suggest *methods of inhibiting oxidation* of a Fischer Tropsch product comprising creating a blended hydrocarbonaceous product by mixing (i) a Fischer Tropsch product (ii) an effective amount of a sulfur-containing petroleum-derived hydrocarbonaceous product, and (iii) an effective amount of an antioxidant selected from the group consisting of phenolic compounds, diphenylamine compounds, and combinations thereof, such that the blended product has a final peroxide number of less than 5 ppm after 7 days and wherein the effective amount of antioxidant in (i) and (ii) is less than the amount that would be required in (i) alone. In fact, Wittenbrink discloses that the Fischer Tropsch base stocks of the invention have superior properties to those of the conventional lubricating oil. As such, Wittenbrink does not address any problems with stability of Fischer Tropsch products during shipment and storage; Wittenbrink does not recognize or address any instability of Fischer Tropsch products during shipment and storage, at least in part, due to the formation of peroxides; and Wittenbrink does not address inhibiting oxidation of the Fischer Tropsch product to overcome these problems. Since Wittenbrink does not address instability, shipment and storage stability problems, inhibiting oxidation, or inhibiting formation of

peroxides, Wittenbrink does not disclose or suggest the presently claimed method of inhibiting oxidation of a Fischer Tropsch product. As such, Applicant respectfully submits that Wittenbrink does not disclose or suggest the presently claimed method of inhibiting oxidation of a Fischer Tropsch product.

In addition, since Wittenbrink discloses that the Fischer Tropsch base stocks of the invention have superior properties to those of the conventional lubricating oil, Wittenbrink "teaches way" from the effective amount of conventional antioxidant required in a blend of a Fischer Tropsch product and a conventional base stock being less than the amount required in a Fischer Tropsch product alone. Applicant respectfully submits that a prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention, and a prior art reference that "teaches away" from the claimed invention is a significant factor to be considered in determining obviousness. *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984). Since Wittenbrink "teaches away" from the effective amount of conventional antioxidant required in a blend of a Fischer Tropsch product and a conventional base stock being less than the amount required in a Fischer Tropsch product alone, Applicant respectfully submits that Berlowitz cannot disclose or suggest the presently claimed methods.

As such, Applicant respectfully submits that Wittenbrink does not disclose or suggest a method of inhibiting oxidation of a Fischer Tropsch product comprising creating a blended hydrocarbonaceous product by mixing (i) a Fischer Tropsch product (ii) an effective amount of a sulfur-containing petroleum-derived hydrocarbonaceous product, and (iii) an effective amount of an antioxidant selected from the group consisting of phenolic compounds, diphenylamine compounds, and combinations thereof, such that the blended product has a final peroxide number of less than 5 ppm after 7 days and wherein the effective amount of antioxidant in (i) and (ii) is less than the amount that would be required in (i) alone.

Furthermore, Applicant respectfully submits that obviousness cannot be predicated on what is not known at the time an invention is made, even if the inherency of a certain feature is later established. *In re Rijckaert*, 9 F.2d 1531, 28 USPQ2d 1955 (Fed. Cir. 1993). Applicant respectfully submits that Wittenbrink does not disclose or suggest any instability of Fischer Tropsch products during shipment

and storage, at least in part, due to the formation of peroxides, and in fact, Wittenbrink discloses that the Fischer Tropsch base stocks of the invention have superior properties to those of the conventional lubricating oil. Since Wittenbrink does not recognize the oxidative instability of Fischer Tropsch products and the resulting problems with shipment and storage stability, Applicant asserts that Wittenbrink cannot render the presently claimed methods for inhibiting oxidation obvious because obviousness cannot be predicated on what is not known at the time an invention is made.

Accordingly, Wittenbrink does not disclose or suggest a method of inhibiting the oxidation of Fischer Tropsch products comprising creating a blended hydrocarbonaceous product by mixing (i) a Fischer Tropsch product (ii) an effective amount of a sulfur-containing petroleum-derived hydrocarbonaceous product, and (iii) an effective amount of an antioxidant selected from the group consisting of phenolic compounds, diphenylamine compounds, and combinations thereof, such that the blended product has a final peroxide number of less than 5 ppm after 7 days and wherein the effective amount of antioxidant in (i) and (ii) is less than the amount that would be required in (i) alone.

Therefore, Applicant respectfully submits that Wittenbrink does not disclose or suggest all of the claim limitations and withdrawal of the rejection of claims 13 – 15 under 35 U.S.C. § 103(a) is respectfully requested.

F. The Claims of Group IV

1. The Claims of Group IV Would Not Have Been Obvious Over Berlowitz '301 or Berlowitz '949 in Combination With Smalheer

Group IV, as defined herein, includes claims 16 and 17. As set forth above, claims 16 and 17 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Berlowitz '301 or Berlowitz '949 in combination with Smalheer.

Claims 16 and 17 depend from claim 13. Claim 16 recites that the method of claim 13 further comprises a step c) processing the blended product with hydrogen to remove at least a portion of sulfur and other impurities that originate from the petroleum-derived hydrocarbonaceous product after the period in which oxidation is to be prevented and claim 17 recites that the method of claim 13 further comprises a

step c) hydrotreating the blended product with hydrogen to remove at least a portion of sulfur and other impurities that originate from the petroleum-derived hydrocarbonaceous product after the period in which oxidation is to be prevented.

The claims of Group IV recite processing the blended product with hydrogen or hydrotreating the blended product to remove at least a portion of sulfur and other impurities that originate from the petroleum-derived hydrocarbonaceous product after the period in which oxidation is to be prevented. According to the invention, a desirable property of Fischer Tropsch products is that they contain essentially no aromatics or heteroatoms, such as sulfur and nitrogen. However, the petroleum-derived hydrocarbonaceous products, added to the Fischer Tropsch products to inhibit oxidation, may add impurities, aromatics, and unwanted heteroatoms (such as sulfur and nitrogen), and the resulting blended product may contain impurities, aromatics, and unwanted heteroatoms that the original Fischer Tropsch product did not contain. Therefore, after the period in which oxidation is to be prevented and before the Fischer Tropsch liquid products are to be sold/used, it is desirable to remove or at least reduce the impurities, aromatics, and unwanted heteroatoms (such as sulfur, nitrogen, metals). The impurities, aromatics, and heteroatom content are reduced by processing the blended product with hydrogen, in particular hydrotreating. (Page 15, Paragraphs [0058] and [0059]).

In addition, according to the presently claimed methods, an effective amount of sulfur-containing petroleum-derived hydrocarbonaceous product and an effective amount of an antioxidant selected from the group consisting of phenolic compounds, diphenylamine compounds, and combinations thereof, are mixed with a Fischer Tropsch product, such that the blended hydrocarbonaceous product has a final peroxide number of less than 5 ppm after 7 days and wherein the effective amount of antioxidant in the Fischer Tropsch product mixed with the sulfur-containing petroleum-derived hydrocarbonaceous product is less than the amount that would be required in the Fischer Tropsch product alone. These phenolic and diphenylamine antioxidants are expensive; therefore, it is desirable that lower levels of these expensive antioxidants are required. (Page 2, Paragraph [0007]).

Applicant respectfully submits that it is an important feature of the present invention that the method is for inhibiting oxidation of a Fischer Tropsch product. Applicant notes that preamble language can limit a claim if it recites not merely a

context in which the invention may be used, but the essence of the invention without which performance of the recited steps is nothing but an academic exercise.

Boehringer Ingelheim Vetmedica Inc. v. Schering-Plough Corp., 65 USPQ2d 1961 (Fed. Cir. 2003), *citing Griffin v. Bertina*, 62 USPQ2d 1431 (Fed. Cir. 2002).

Applicant respectfully submits that the present preamble, reciting that the method is for inhibiting oxidation of a Fischer Tropsch product, recites the essence of the invention and thus provides a distinguishing feature.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine the reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. MPEP § 2143.

Applicant respectfully submits that Berlowitz '301 and Berlowitz '949 do not disclose or suggest *methods of inhibiting oxidation* of a Fischer Tropsch product comprising creating a blended hydrocarbonaceous product by mixing (i) a Fischer Tropsch product (ii) an effective amount of a sulfur-containing petroleum-derived hydrocarbonaceous product, and (iii) an effective amount of an antioxidant selected from the group consisting of phenolic compounds, diphenylamine compounds, and combinations thereof, such that the blended product has a final peroxide number of less than 5 ppm after 7 days and wherein the effective amount of antioxidant in (i) and (ii) is less than the amount that would be required in (i) alone.

In fact, Berlowitz '301 discloses that the oxidation resistance and stability of Fischer Tropsch products are superior to conventional base stocks. As such, Berlowitz '301 and Berlowitz '949 do not address any problems with stability of Fischer Tropsch products during shipment and storage; Berlowitz '301 and Berlowitz '949 do not recognize or address any instability of Fischer Tropsch products during shipment and storage, at least in part, due to the formation of peroxides; and Berlowitz '301 and Berlowitz '949 do not address inhibiting oxidation of the Fischer Tropsch product to overcome these problems. Since neither Berlowitz '301 nor Berlowitz '949 addresses instability, shipment or storage stability problems, inhibiting oxidation, inhibiting formation of peroxides, neither Berlowitz '301 nor Berlowitz

'949 discloses or suggests the presently claimed method of inhibiting oxidation of a Fischer Tropsch product.

In addition, since Berlowitz '301 discloses that the oxidation resistance and stability of Fischer Tropsch products are superior to conventional base stocks, Berlowitz "teaches way" from the effective amount of conventional antioxidant required in a blend of a Fischer Tropsch product and a conventional base stock being less than the amount required in a Fischer Tropsch product alone. Applicant respectfully submits that a prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention, and a prior art reference that "teaches away" from the claimed invention is a significant factor to be considered in determining obviousness. *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984). Since Berlowitz "teaches away" from the effective amount of conventional antioxidant required in a blend of a Fischer Tropsch product and a conventional base stock being less than the amount required in a Fischer Tropsch product alone, Applicant respectfully submits that Berlowitz cannot disclose or suggest the presently claimed methods.

Applicant further respectfully submits that Berlowitz '301 and Berlowitz '949 merely disclose that in some cases one or more additional base stocks may be mixed with, added to or blended with one or more of the Fischer Tropsch derived base stocks to provide fully formulated lube oils comprising this blend. Berlowitz '301 and Berlowitz '949 do not address the additional base stocks may add impurities, aromatics, and unwanted heteroatoms (such as sulfur and nitrogen) to the Fischer Tropsch derived base stocks, which otherwise would not contain these species. As such, Berlowitz '301 and Berlowitz '949 do not disclose or suggest processing the blended product with hydrogen or hydrotreating the blended product to remove at least a portion of sulfur and other impurities that originate from the petroleum-derived hydrocarbonaceous product after the period in which oxidation is to be prevented.

Moreover, as described above Berlowitz '301 and Berlowitz '949 do not disclose or suggest the presently claimed methods of inhibiting oxidation of a Fischer Tropsch product comprising creating a blended hydrocarbonaceous product by mixing (i) a Fischer Tropsch product (ii) an effective amount of a sulfur-containing petroleum-derived hydrocarbonaceous product, and (iii) an effective amount of an

antioxidant selected from the group consisting of phenolic compounds, diphenylamine compounds, and combinations thereof, such that the blended product has a final peroxide number of less than 5 ppm after 7 days and wherein the effective amount of antioxidant in (i) and (ii) is less than the amount that would be required in (i) alone. Since Berlowitz '301 and Berlowitz '949 do not disclose or suggest inhibiting oxidation and do not disclose or suggest mixing the one or more additional base stocks to inhibit oxidation, Applicant further respectfully submits that Berlowitz '301 and Berlowitz '949 do not disclose or suggest processing the blended product with hydrogen to remove at least a portion of sulfur and other impurities that originate from the petroleum-derived product after the period in which oxidation is to be prevented and/or to provide a final product with a sulfur content of less than 100 ppm. As described above, it is desirable that the Fischer Tropsch products and the blended products comprising the Fischer Tropsch products contain essentially no aromatics or heteroatoms, such as sulfur and nitrogen; therefore, after the period in which oxidation is to be prevented and before the Fischer Tropsch liquid products are to be sold/used, the impurities (i.e., aromatics, heteroatoms) are removed or at least reduced.

Furthermore, Applicant respectfully submits that obviousness cannot be predicated on what is not known at the time an invention is made, even if the inherency of a certain feature is later established. *In re Rijckaert*, 9 F.2d 1531, 28 USPQ2d 1955 (Fed. Cir. 1993). Applicant respectfully submits that neither Berlowitz '301 nor Berlowitz '949 discloses or suggests any instability of Fischer Tropsch products during shipment and storage, at least in part, due to the formation of peroxides, and in fact, Berlowitz '301 discloses that the oxidation resistance and stability of Fischer Tropsch products was superior to conventional base stocks. Since neither Berlowitz '301 nor Berlowitz '949 recognizes the oxidative instability of Fischer Tropsch products and the resulting problems with storage stability, Applicant asserts that Berlowitz '301 and Berlowitz '949 cannot render the presently claimed methods for inhibiting oxidation obvious because obviousness cannot be predicated on what is not known at the time an invention is made.

Accordingly, Applicant respectfully submits that neither Berlowitz '301 nor Berlowitz '949 discloses or suggests the presently claimed methods of inhibiting oxidation of Fischer Tropsch products comprising creating a blended

hydrocarbonaceous product by mixing (i) a Fischer Tropsch product (ii) an effective amount of a sulfur-containing petroleum-derived hydrocarbonaceous product, and (iii) an effective amount of an antioxidant selected from the group consisting of phenolic compounds, diphenylamine compounds, and combinations thereof, such that the blended product has a final peroxide number of less than 5 ppm after 7 days and wherein the effective amount of antioxidant in (i) and (ii) is less than the amount that would be required in (i) alone. Applicant further respectfully submits that neither Berlowitz '301 nor Berlowitz '949 discloses or suggests the presently claimed methods of inhibiting oxidation of Fischer Tropsch products comprising processing the blended product with hydrogen or hydrotreating the blended product to remove at least a portion of sulfur and other impurities that originate from the petroleum-derived hydrocarbonaceous product after the period in which oxidation is to be prevented.

Smalheer merely discloses the chemistry of known lubricant additives, including anti-oxidants.

Accordingly, Applicant respectfully submits that even if there were some suggestion or motivation to combine Berlowitz '301 or Berlowitz '949 and Smalheer and a reasonable expectation of success, Berlowitz '301 or Berlowitz '949 and Smalheer, even when combined, do not disclose or suggest all the claim limitations. None of Berlowitz '301, Berlowitz '949, or Smalheer disclose or suggest a method of inhibiting oxidation of a Fischer Tropsch product comprising creating a blended hydrocarbonaceous product by mixing (i) a Fischer Tropsch product (ii) an effective amount of a sulfur-containing petroleum-derived hydrocarbonaceous product, and (iii) an effective amount of an antioxidant selected from the group consisting of phenolic compounds, diphenylamine compounds, and combinations thereof, such that the blended product has a final peroxide number of less than 5 ppm after 7 days and wherein the effective amount of antioxidant in (i) and (ii) is less than the amount that would be required in (i) alone; and further comprising processing the blended product with hydrogen or hydrotreating the blended product to remove at least a portion of sulfur and other impurities that originate from the petroleum-derived hydrocarbonaceous product after the period in which oxidation is to be prevented.

Accordingly, Applicant respectfully submits that even if when combined Berlowitz '301 or Berlowitz '949 in combination with Smalheer do not disclose or

suggest all the claim limitations and withdrawal of the rejection of claims 16 and 17 under 35 U.S.C. § 103(a) is respectfully requested.

2. The Claims of Group IV Would Not Have Been Obvious Over Wittenbrink

As set forth above, claims 16 and 17 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Wittenbrink.

Claims 16 and 17 depend from claim 13. Claim 16 recites that the method of claim 13 further comprises a step c) processing the blended product with hydrogen to remove at least a portion of sulfur and other impurities that originate from the petroleum-derived hydrocarbonaceous product after the period in which oxidation is to be prevented and claim 17 recites that the method of claim 13 further comprises a step c) hydrotreating the blended product with hydrogen to remove at least a portion of sulfur and other impurities that originate from the petroleum-derived hydrocarbonaceous product after the period in which oxidation is to be prevented.

The claims of Group IV recite processing the blended product with hydrogen or hydrotreating the blended product to remove at least a portion of sulfur and other impurities that originate from the petroleum-derived hydrocarbonaceous product after the period in which oxidation is to be prevented. According to the invention, a desirable property of Fischer Tropsch products is that they contain essentially no aromatics or heteroatoms, such as sulfur and nitrogen. However, the petroleum-derived hydrocarbonaceous products, added to the Fischer Tropsch products to inhibit oxidation, may add impurities, aromatics, and unwanted heteroatoms (such as sulfur and nitrogen), and the resulting blended product may contain impurities, aromatics, and unwanted heteroatoms that the original Fischer Tropsch product did not contain. Therefore, after the period in which oxidation is to be prevented and before the Fischer Tropsch liquid products are to be sold/used, it is desirable to remove or at least reduce the impurities, aromatics, and unwanted heteroatoms (such as sulfur, nitrogen, metals). The impurities, aromatics, and heteroatom content are reduced by processing the blended product with hydrogen, in particular hydrotreating. (Page 15, Paragraphs [0058] and [0059]).

In addition, according to the presently claimed methods, an effective amount of sulfur-containing petroleum-derived hydrocarbonaceous product and an effective

amount of an antioxidant selected from the group consisting of phenolic compounds, diphenylamine compounds, and combinations thereof, are mixed with a Fischer Tropsch product, such that the blended hydrocarbonaceous product has a final peroxide number of less than 5 ppm after 7 days and wherein the effective amount of antioxidant in the Fischer Tropsch product mixed with the sulfur-containing petroleum-derived hydrocarbonaceous product is less than the amount that would be required in the Fischer Tropsch product alone. These phenolic and diphenylamine antioxidants are expensive; therefore, it is desirable that lower levels of these expensive antioxidants are required. (Page 2, Paragraph [0007]).

Applicant respectfully submits that it is an important feature of the present invention that the method is for inhibiting oxidation of a Fischer Tropsch product. Applicant notes that preamble language can limit a claim if it recites not merely a context in which the invention may be used, but the essence of the invention without which performance of the recited steps is nothing but an academic exercise.

Boehringer Ingelheim Vetmedica Inc. v. Schering-Plough Corp., 65 USPQ2d 1961 (Fed. Cir. 2003), *citing Griffin v. Bertina*, 62 USPQ2d 1431 (Fed. Cir. 2002).

Applicant respectfully submits that the present preamble, reciting that the method is for inhibiting oxidation of a Fischer Tropsch product, recites the essence of the invention and thus provides a distinguishing feature.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine the reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. MPEP § 2143.

Applicant respectfully submits that Wittenbrink does not disclose or suggest *methods of inhibiting oxidation* of a Fischer Tropsch product comprising creating a blended hydrocarbonaceous product by mixing (i) a Fischer Tropsch product (ii) an effective amount of a sulfur-containing petroleum-derived hydrocarbonaceous product, and (iii) an effective amount of an antioxidant selected from the group consisting of phenolic compounds, diphenylamine compounds, and combinations thereof, such that the blended product has a final peroxide number of less than 5 ppm after 7 days and wherein the effective amount of antioxidant in (i) and (ii) is less than

the amount that would be required in (i) alone. In fact, Wittenbrink discloses that the Fischer Tropsch base stocks of the invention have superior properties to those of the conventional lubricating oil. As such, Wittenbrink does not addresses any problems with stability of Fischer Tropsch products during shipment and storage; Wittenbrink does not recognize or address any instability of Fischer Tropsch products during shipment and storage, at least in part, due to the formation of peroxides; and Wittenbrink does not address inhibiting oxidation of the Fischer Tropsch product to overcome these problems. Since Wittenbrink does not address instability, shipment and storage stability problems, inhibiting oxidation, or inhibiting formation of peroxides, Wittenbrink does not disclose or suggest the presently claimed method of inhibiting oxidation of a Fischer Tropsch product. As such, Applicant respectfully submits that Wittenbrink does not disclose or suggest the presently claimed method of inhibiting oxidation of a Fischer Tropsch product.

In addition, since Wittenbrink discloses that the Fischer Tropsch base stocks of the invention have superior properties to those of the conventional lubricating oil, Wittenbrink "teaches way" from the effective amount of conventional antioxidant required in a blend of a Fischer Tropsch product and a conventional base stock being less than the amount required in a Fischer Tropsch product alone. Applicant respectfully submits that a prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention, and a prior art reference that "teaches away" from the claimed invention is a significant factor to be considered in determining obviousness. *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984). Since Wittenbrink "teaches away" from the effective amount of conventional antioxidant required in a blend of a Fischer Tropsch product and a conventional base stock being less than the amount required in a Fischer Tropsch product alone, Applicant respectfully submits that Berlowitz cannot disclose or suggest the presently claimed methods.

Applicant further respectfully submits that Wittenbrink merely disclose that in some cases one or more additional base stocks may be mixed with, added to or blended with one or more of the Fischer Tropsch derived base stocks to provide fully formulated lube oils comprising this blend. Wittenbrink does not address that the additional base stocks may add impurities, aromatics, and unwanted heteroatoms

(such as sulfur and nitrogen) to the Fischer Tropsch derived base stocks, which otherwise would not contain these species. As such, Wittenbrink does not disclose or suggest processing the blended product with hydrogen or hydrotreating the blended product to remove at least a portion of sulfur and other impurities that originate from the petroleum-derived hydrocarbonaceous product after the period in which oxidation is to be prevented.

Moreover, as described above Wittenbrink does not disclose or suggest the presently claimed methods of inhibiting oxidation of a Fischer Tropsch product. Since Wittenbrink does not disclose or suggest inhibiting oxidation and does not disclose or suggest mixing the one or more additional base stocks to inhibit oxidation, Applicant further respectfully submits that Wittenbrink does not disclose or suggest processing the blended product with hydrogen or hydrotreating the blended product to remove at least a portion of sulfur and other impurities that originate from the petroleum-derived hydrocarbonaceous product after the period in which oxidation is to be prevented.. As described above, it is desirable that the Fischer Tropsch products and the blended products comprising the Fischer Tropsch products contain essentially no aromatics or heteroatoms, such as sulfur and nitrogen; therefore, after the period in which oxidation is to be prevented and before the Fischer Tropsch liquid products are to be sold/used, the impurities (i.e., aromatics, heteroatoms) are removed or at least reduced.

Furthermore, Applicant respectfully submits that obviousness cannot be predicated on what is not known at the time an invention is made, even if the inherency of a certain feature is later established. *In re Rijckaert*, 9 F.2d 1531, 28 USPQ2d 1955 (Fed. Cir. 1993). Applicant respectfully submits that Wittenbrink does not disclose or suggest any instability of Fischer Tropsch products during shipment and storage, at least in part, due to the formation of peroxides, and in fact, Wittenbrink discloses that the Fischer Tropsch base stocks of the invention have superior properties to those of the conventional lubricating oil. Since Wittenbrink does not recognize the oxidative instability of Fischer Tropsch products and the resulting problems with shipment and storage stability, Applicant asserts that Wittenbrink cannot render the presently claimed methods for inhibiting oxidation obvious because obviousness cannot be predicated on what is not known at the time an invention is made.

Accordingly, Wittenbrink does not disclose or suggest a method of inhibiting oxidation of a Fischer Tropsch product comprising creating a blended hydrocarbonaceous product by mixing (i) a Fischer Tropsch product (ii) an effective amount of a sulfur-containing petroleum-derived hydrocarbonaceous product, and (iii) an effective amount of an antioxidant selected from the group consisting of phenolic compounds, diphenylamine compounds, and combinations thereof, such that the blended product has a final peroxide number of less than 5 ppm after 7 days and wherein the effective amount of antioxidant in (i) and (ii) is less than the amount that would be required in (i) alone and further comprising processing the blended product with hydrogen or hydrotreating the blended product to remove at least a portion of sulfur and other impurities that originate from the petroleum-derived hydrocarbonaceous product after the period in which oxidation is to be prevented.

Therefore, Applicant respectfully submits that Wittenbrink does not disclose or suggest all the claim limitations. Accordingly, withdrawal of the rejection of claims 16 and 17 under 35 U.S.C. § 103(a) is respectfully requested.

G. The Claims of Group V

1. The Claims of Group V Would Not Have Been Obvious Over Berlowitz '301 or Berlowitz '949 in Combination With Smalheer

Group V, as defined herein, includes claims 18 – 20. As set forth above, claims 18 – 20 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Berlowitz '301 or Berlowitz '949 in combination with Smalheer.

Independent claim 18 recites a blended hydrocarbonaceous product comprising a Fischer Tropsch derived product; an effective amount of sulfur-containing petroleum-derived hydrocarbonaceous product; and an effective amount of an antioxidant selected from the group consisting of phenolic compounds, diphenylamine compounds, and combinations thereof, such that the blended hydrocarbonaceous product has a final peroxide number of less than 5 ppm. The effective amount of antioxidant is less than the amount that would be required a Fischer Tropsch derived product alone.

The claims of Group V are directed to blended hydrocarbonaceous products comprising a Fischer Tropsch derived product that resist oxidation. These blended

hydrocarbonaceous products address the increased need for effective antioxidants during shipment and storage of Fischer Tropsch products due to formation of peroxides. The blended hydrocarbonaceous products comprise an effective amount of sulfur-containing petroleum-derived hydrocarbonaceous product and an effective amount of an antioxidant selected from the group consisting of phenolic compounds, diphenylamine compounds, and combinations thereof, such that the blended hydrocarbonaceous product has a final peroxide number of less than 5 ppm after 7 days and wherein the effective amount of antioxidant in the Fischer Tropsch product mixed with the sulfur-containing petroleum-derived hydrocarbonaceous product is less than the amount that would be required in the Fischer Tropsch product alone. These phenolic and diphenylamine antioxidants are expensive; therefore, it is desirable that the blended hydrocarbonaceous product requires lower levels of these expensive antioxidants. (Page 2, Paragraph [0007]).

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine the reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. MPEP § 2143.

Applicant respectfully submits that Berlowitz '301 and Berlowitz '949 do not disclose or suggest a blended hydrocarbonaceous product comprising a Fischer Tropsch derived product; an effective amount of sulfur-containing petroleum-derived hydrocarbonaceous product; and an effective amount of an antioxidant selected from the group consisting of phenolic compounds, diphenylamine compounds, and combinations thereof, such that the blended hydrocarbonaceous product has a final peroxide number of less than 5 ppm, and wherein the effective amount of antioxidant is less than the amount that would be required a Fischer Tropsch derived product alone.

Berlowitz '301 discloses that the oxidation resistance and stability of Fischer Tropsch products are superior to conventional base stocks. As such, Berlowitz '301 and Berlowitz '949 do not address a blended hydrocarbonaceous product comprising a Fischer Tropsch product and an antioxidant such that the blended product is stable to oxidation during shipment and storage; Berlowitz '301 and Berlowitz '949 do not

recognize or address any instability of Fischer Tropsch products during shipment and storage, at least in part, due to the formation of peroxides. Since neither Berlowitz '301 nor Berlowitz '949 addresses instability, shipment and storage stability problems, inhibiting oxidation of a Fischer Tropsch product, or inhibiting formation of peroxides, neither Berlowitz '301 nor Berlowitz '949 discloses or suggests a blended product comprising a Fischer Tropsch product and an antioxidant such that the blended product has a final peroxide number of less than 5 ppm.

In addition, since Berlowitz '301 discloses that the oxidation resistance and stability of Fischer Tropsch products are superior to conventional base stocks, Berlowitz "teaches way" from a blended hydrocarbonaceous product comprising a Fischer Tropsch product, a sulfur-containing petroleum-derived hydrocarbonaceous product (i.e., a conventional base stock), and an effective amount of a conventional antioxidant, wherein the effective amount of conventional antioxidant required in the blend of a Fischer Tropsch product and the conventional base stock is less than the amount required in a Fischer Tropsch product alone. Applicant respectfully submits that a prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention, and a prior art reference that "teaches away" from the claimed invention is a significant factor to be considered in determining obviousness. *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984). Since Berlowitz "teaches away" from the effective amount of conventional antioxidant required in a blend of a Fischer Tropsch product and a conventional base stock being less than the amount required in a Fischer Tropsch product alone, Applicant respectfully submits that Berlowitz cannot disclose or suggest the presently claimed blended hydrocarbonaceous products.

As such, Applicant respectfully submits that neither Berlowitz '301 nor Berlowitz '949 discloses or suggests a blended hydrocarbonaceous product comprising a Fischer Tropsch derived product; an effective amount of sulfur-containing petroleum-derived hydrocarbonaceous product; and an effective amount of an antioxidant selected from the group consisting of phenolic compounds, diphenylamine compounds, and combinations thereof, such that the blended hydrocarbonaceous product has a final peroxide number of less than 5 ppm, and

wherein the effective amount of antioxidant is less than the amount that would be required a Fischer Tropsch derived product alone.

Smalheer merely discloses the chemistry of known lubricant additives, including anti-oxidants.

Accordingly, Applicant respectfully submits that even if there were some suggestion or motivation to combine Berlowitz '301 or Berlowitz '949 and Smalheer and a reasonable expectation of success, Berlowitz '301 or Berlowitz '949 and Smalheer, even when combined, do not disclose or suggest all the claim limitations. None of Berlowitz '301, Berlowitz '949, or Smalheer disclose or suggest a blended hydrocarbonaceous product comprising a Fischer Tropsch derived product; an effective amount of sulfur-containing petroleum-derived hydrocarbonaceous product; and an effective amount of an antioxidant selected from the group consisting of phenolic compounds, diphenylamine compounds, and combinations thereof, such that the blended hydrocarbonaceous product has a final peroxide number of less than 5 ppm, and wherein the effective amount of antioxidant is less than the amount that would be required a Fischer Tropsch derived product alone.

Accordingly, Applicant respectfully submits that even if combined Berlowitz '301 or Berlowitz '949 in combination with Smalheer do not disclose or suggest all the claim limitations and withdrawal of the rejection of claims 18 – 20 under 35 U.S.C. § 103(a) is respectfully requested.

2. The Claims of Group V Would Not Have Been Obvious Over Wittenbrink

As set forth above, claims 18 – 20 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Wittenbrink.

As described above, independent claim 18 recites a blended hydrocarbonaceous product comprising a Fischer Tropsch derived product; an effective amount of sulfur-containing petroleum-derived hydrocarbonaceous product; and an effective amount of an antioxidant selected from the group consisting of phenolic compounds, diphenylamine compounds, and combinations thereof, such that the blended hydrocarbonaceous product has a final peroxide number of less than 5 ppm. The effective amount of antioxidant is less than the amount that would be required a Fischer Tropsch derived product alone.

The claims of Group V are directed to blended hydrocarbonaceous products comprising a Fischer Tropsch derived product that resist oxidation. These blended hydrocarbonaceous products address the increased need for effective antioxidants during shipment and storage of Fischer Tropsch products due to formation of peroxides. The blended hydrocarbonaceous products comprise an effective amount of sulfur-containing petroleum-derived hydrocarbonaceous product and an effective amount of an antioxidant selected from the group consisting of phenolic compounds, diphenylamine compounds, and combinations thereof, such that the blended hydrocarbonaceous product has a final peroxide number of less than 5 ppm after 7 days and wherein the effective amount of antioxidant in the Fischer Tropsch product mixed with the sulfur-containing petroleum-derived hydrocarbonaceous product is less than the amount that would be required in the Fischer Tropsch product alone. These phenolic and diphenylamine antioxidants are expensive; therefore, it is desirable that the blended hydrocarbonaceous product requires lower levels of these expensive antioxidants. (Page 2, Paragraph [0007]).

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine the reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. MPEP § 2143.

Applicant respectfully submits that Wittenbrink does not disclose or suggest a blended hydrocarbonaceous product comprising a Fischer Tropsch derived product; an effective amount of sulfur-containing petroleum-derived hydrocarbonaceous product; and an effective amount of an antioxidant selected from the group consisting of phenolic compounds, diphenylamine compounds, and combinations thereof, such that the blended hydrocarbonaceous product has a final peroxide number of less than 5 ppm, and wherein the effective amount of antioxidant is less than the amount that would be required a Fischer Tropsch derived product alone.

Wittenbrink discloses that the Fischer Tropsch base stocks of the invention have superior properties to those of the conventional lubricating oil. As such, Wittenbrink does not address a blended hydrocarbonaceous product comprising a Fischer Tropsch product that is stable to oxidation during shipment and storage;

Wittenbrink does not recognize or address any instability of Fischer Tropsch products during shipment and storage, at least in part, due to the formation of peroxides. Since Wittenbrink does not address instability, storage stability problems, inhibiting oxidation of a Fischer Tropsch product, or inhibiting formation of peroxides, Wittenbrink does not disclose or suggest a blended product comprising a Fischer Tropsch product that has a final peroxide number of less than 5 ppm.

In addition, since Wittenbrink discloses that the Fischer Tropsch base stocks of the invention have superior properties to those of the conventional lubricating oil, Wittenbrink "teaches way" from a blended hydrocarbonaceous product comprising a Fischer Tropsch product, a sulfur-containing petroleum-derived hydrocarbonaceous product (i.e., a conventional base stock), and an effective amount of a conventional antioxidant, wherein the effective amount of conventional antioxidant required in the blend of a Fischer Tropsch product and the conventional base stock is less than the amount required in a Fischer Tropsch product alone. Applicant respectfully submits that a prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention, and a prior art reference that "teaches away" from the claimed invention is a significant factor to be considered in determining obviousness. *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984). Since Wittenbrink "teaches away" from the effective amount of conventional antioxidant required in a blend of a Fischer Tropsch product and a conventional base stock being less than the amount required in a Fischer Tropsch product alone, Applicant respectfully submits that Wittenbrink cannot disclose or suggest the presently claimed blended hydrocarbonaceous products.

As such, Applicant respectfully submits that Wittenbrink does not disclose or suggest a blended hydrocarbonaceous product comprising a Fischer Tropsch derived product; an effective amount of sulfur-containing petroleum-derived hydrocarbonaceous product; and an effective amount of an antioxidant selected from the group consisting of phenolic compounds, diphenylamine compounds, and combinations thereof, such that the blended hydrocarbonaceous product has a final peroxide number of less than 5 ppm, and wherein the effective amount of antioxidant is less than the amount that would be required a Fischer Tropsch derived product alone.

Accordingly, withdrawal of the rejection of claims 18 – 20 under 35 U.S.C. § 103(a) is respectfully requested.

H. The Claims of Group VI

1. The Claims of Group VI Would Not Have Been Obvious Over Berlowitz '301 or Berlowitz '949 in Combination With Smalheer

Group VI, as defined herein, includes claims 21 – 25 and 28. As set forth above, claims 21 – 25 and 28 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Berlowitz '301 or Berlowitz '949 in combination with Smalheer.

Independent claim 21 recites a blended hydrocarbonaceous product comprising a Fischer Tropsch derived product and an effective amount of a sulfur-containing petroleum-derived hydrocarbonaceous product such that the blended hydrocarbonaceous product has a final peroxide number of less than 5 ppm, and has a sulfur content of greater than 1 ppm and less than 100 ppm.

The claims of Group VI are directed to blended hydrocarbonaceous products comprising a Fischer Tropsch derived product that resist oxidation. These blended hydrocarbonaceous products address the increased need for effective antioxidants during shipment and storage of Fischer Tropsch products due to formation of peroxides. The blended hydrocarbonaceous products comprise an effective amount of a sulfur-containing petroleum-derived hydrocarbonaceous product such that the blended hydrocarbonaceous product has a final peroxide number of less than 5 ppm, and has a sulfur content of greater than 1 ppm and less than 100 ppm. An effective amount of sulfur-containing petroleum-derived hydrocarbonaceous product is the amount that inhibits oxidation sufficiently such that the blended product have a final peroxide number of less than 5 ppm, preferably less than 3 ppm, and more preferably less than 1 ppm after 7 days. (Page 12, Paragraph [0046]).

According to the present invention, petroleum-derived hydrocarbonaceous products are desirable agents for inhibiting oxidation in the present invention due to their high compatibility with the Fischer Tropsch derived products. As a result of their high compatibility, the petroleum-derived products reside blended in the Fischer Tropsch products, and thus are particularly effective in inhibiting oxidation. (Page 13, Paragraph [0050]).

The blended products of the presently claimed invention have superior oxidation resistance, in particular peroxide resistance, compared to that of the Fischer Tropsch product alone.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine the reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. MPEP § 2143.

Applicant respectfully submits that Berlowitz '301 and Berlowitz '949 do not disclose or suggest a blended hydrocarbonaceous product comprising a Fischer Tropsch derived product; an effective amount of sulfur-containing petroleum-derived hydrocarbonaceous product such that the blended hydrocarbonaceous product has a final peroxide number of less than 5 ppm, and has a sulfur content of greater than 1 ppm and less than 100 ppm.

Berlowitz '301 discloses that the oxidation resistance and stability of Fischer Tropsch products are superior to conventional base stocks. As such, Berlowitz '301 and Berlowitz '949 do not address any problems with stability of Fischer Tropsch products during shipment and storage, at least in part, due to the formation of peroxides. As such, Berlowitz '301 and Berlowitz '949 do not address a blended hydrocarbonaceous product comprising a Fischer Tropsch product that is stable to oxidation during shipment and storage. As Berlowitz '301 and Berlowitz '949 do not address any problems with shipment and storage stability, Berlowitz '301 and Berlowitz '949 do not disclose or suggest a blended Fischer Tropsch product to overcome these problems. Furthermore, since Berlowitz '301 and Berlowitz '949 do not address instability, storage stability problems, inhibiting oxidation, or inhibiting formation of peroxides, Berlowitz '301 and Berlowitz '949 do not disclose or suggest a blended Fischer Tropsch product comprising an effective amount of a sulfur-containing petroleum-derived hydrocarbonaceous product to provide a blended Fischer Tropsch product with improved the oxidation resistance, in particular, having a final peroxide number of less than 5 ppm after 7 days. In addition, neither Berlowitz '301 nor Berlowitz '949 discloses or suggests a blended Fischer Tropsch product comprising an effective amount of sulfur-containing petroleum-derived

hydrocarbonaceous product such that the blended product have a sulfur content of greater than 1 ppm and less than 100 ppm.

Accordingly, Applicant respectfully submits that neither Berlowitz '301 nor Berlowitz '949 discloses or suggests a blended product comprising a Fischer Tropsch product and an effective amount of sulfur-containing petroleum-derived hydrocarbonaceous product such that the blended product has a final peroxide number of less than 5 ppm, and has a sulfur content of greater than 1 ppm and less than 100 ppm.

Smalheer merely teaches the chemistry of known lubricant additives, including anti-oxidants.

Accordingly, Applicant respectfully submits that even if there were some suggestion or motivation to combine Berlowitz '301 or Berlowitz '949 and Smalheer and a reasonable expectation of success, Berlowitz '301 or Berlowitz '949 and Smalheer, even when combined, do not teach or suggest all the claim limitations. None of Berlowitz '301, Berlowitz '949, or Smalheer discloses or suggests a blended product comprising a Fischer Tropsch product and an *effective amount* of sulfur-containing petroleum-derived hydrocarbonaceous product such that the blended hydrocarbonaceous product has a final peroxide number of less than 5 ppm, and has a sulfur content of greater than 1 ppm and less than 100 ppm.

Accordingly, withdrawal of the rejection of claims 21 – 25 and 28 under 35 U.S.C. § 103(a) is respectfully requested.

2. The Claims of Group VI Would Not Have Been Obvious Over Wittenbrink

As set forth above, claims 21 – 25 and 28 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Wittenbrink.

As described above, independent claim 21 recites a blended hydrocarbonaceous product comprising a Fischer Tropsch derived product and an effective amount of a sulfur-containing petroleum-derived hydrocarbonaceous product such that the blended hydrocarbonaceous product has a final peroxide number of less than 5 ppm, and has a sulfur content of greater than 1 ppm and less than 100 ppm.

The claims of Group VI are directed to blended hydrocarbonaceous products comprising a Fischer Tropsch derived product that resist oxidation. These blended hydrocarbonaceous products address the increased need for effective antioxidants during shipment and storage of Fischer Tropsch products due to formation of peroxides. The blended hydrocarbonaceous products comprise an effective amount of a sulfur-containing petroleum-derived hydrocarbonaceous product such that the blended hydrocarbonaceous product has a final peroxide number of less than 5 ppm, and has a sulfur content of greater than 1 ppm and less than 100 ppm. An effective amount of sulfur-containing petroleum-derived hydrocarbonaceous product is the amount that inhibits oxidation sufficiently such that the blended product have a final peroxide number of less than 5 ppm, preferably less than 3 ppm, and more preferably less than 1 ppm after 7 days. (Page 12, Paragraph [0046]).

According to the present invention, petroleum-derived hydrocarbonaceous products are desirable agents for inhibiting oxidation in the present invention due to their high compatibility with the Fischer Tropsch derived products. As a result of their high compatibility, the petroleum-derived products reside blended in the Fischer Tropsch products, and thus are particularly effective in inhibiting oxidation. (Page 13, Paragraph [0050]).

The blended products of the presently claimed invention have superior oxidation resistance, in particular peroxide resistance, compared to that of the Fischer Tropsch product alone.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine the reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. MPEP § 2143.

Applicant respectfully submits that Wittenbrink does not disclose or suggest a blended hydrocarbonaceous product comprising a Fischer Tropsch derived product and an effective amount of sulfur-containing petroleum-derived hydrocarbonaceous product such that the blended hydrocarbonaceous product has a final peroxide number of less than 5 ppm, and has a sulfur content of greater than 1 ppm and less than 100 ppm.

Wittenbrink discloses that the base stocks of the invention have superior properties to those of the conventional lubricating oil. As such, Wittenbrink does not address any problems with stability of Fischer Tropsch products during shipment and storage, at least in part, due to the formation of peroxides. As such, Wittenbrink does not address a blended hydrocarbonaceous product comprising a Fischer Tropsch product that is stable to oxidation during shipment and storage. As Wittenbrink does not address any problems with shipment and storage stability, Wittenbrink does not disclose or suggest a blended Fischer Tropsch product to overcome these problems. Furthermore, since Wittenbrink does not address instability, storage stability problems, inhibiting oxidation, or inhibiting formation of peroxides, Wittenbrink does not disclose or suggest a blended Fischer Tropsch product comprising an effective amount of a sulfur-containing petroleum-derived hydrocarbonaceous product to provide a blended Fischer Tropsch product with improved the oxidation resistance, in particular, having a final peroxide number of less than 5 ppm after 7 days. In addition, Wittenbrink does not disclose or suggest a blended Fischer Tropsch product comprising an effective amount of sulfur-containing petroleum-derived hydrocarbonaceous product such that the blended product have a sulfur content of greater than 1 ppm and less than 100 ppm.

Accordingly, Applicant respectfully submits that Wittenbrink does not disclose or suggest a blended product comprising a Fischer Tropsch product and an effective amount of sulfur-containing petroleum-derived hydrocarbonaceous product such that the blended product has a final peroxide number of less than 5 ppm, and has a sulfur content of greater than 1 ppm and less than 100 ppm. Therefore, withdrawal of the rejection of claims 21 – 25 and 28 under 35 U.S.C. § 103(a) is respectfully requested.

IX. Conclusion

For at least the reasons set forth above, Applicant respectfully submits that the rejections of claims 1 – 5, 7 – 25, and 28 are improper and should be reversed.

Respectfully submitted,

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Appendix A

1. (Previously presented) A method of inhibiting oxidation of a Fischer Tropsch product comprising the steps of:
 - a) synthesizing a Fischer Tropsch product;
 - b) adding an effective amount of a petroleum-derived hydrocarbonaceous product to provide a blended product having a sulfur content of greater than 1 ppm and less than 100 ppm and having a final peroxide number of less than 5 ppm after 7 days; and
 - c) mixing the petroleum-derived hydrocarbonaceous product into the Fischer Tropsch product to provide the blended product.
2. (Original) A method of inhibiting oxidation of a Fischer Tropsch product according to claim 1, wherein an effective amount of petroleum-derived hydrocarbonaceous product is added to provide a blended product having a peroxide number of less than 3 ppm after 7 days.
3. (Original) A method of inhibiting oxidation of a Fischer Tropsch product according to claim 1, wherein an effective amount of petroleum-derived hydrocarbonaceous product is added to provide a blended product having a peroxide number of less than 1 ppm after 7 days.
4. (Original) A method according to claim 1, wherein the effective amount of petroleum-derived hydrocarbonaceous product is from 10 to 75 wt%.
5. (Original) A method according to claim 4, wherein the effective amount of petroleum-derived hydrocarbonaceous product is from 10 to 30 wt%.
6. (Canceled)
7. (Original) A method according to claim 1, further comprising a step d) processing the blended product with hydrogen to remove at least a portion of sulfur and other impurities that originate from the petroleum-derived hydrocarbonaceous product after the period in which oxidation is to be prevented.

8. (Original) A method according to claim 1, further comprising a step d) hydrotreating the blended product to remove at least a portion of sulfur and other impurities that originate from the petroleum-derived hydrocarbonaceous product after the period in which oxidation is to be prevented.

9. (Previously presented) A method of inhibiting oxidation of a Fischer Tropsch product comprising the steps of:

- a) synthesizing a Fischer Tropsch product;
- b) adding an effective amount of a petroleum-derived hydrocarbonaceous product which contains sulfur to the Fischer Tropsch product;
- c) mixing the petroleum-derived hydrocarbonaceous product into the Fischer Tropsch product to provide a blended product having a final peroxide number of less than 5 ppm after 7 days; and
- d) processing the blended product with hydrogen to provide a final product with a sulfur content of less than 100 ppm.

10. (Original) A method according to claim 9, wherein the final product has a sulfur content of less than 10 ppm.

11. (Original) A method according to claim 9, wherein the final product has a sulfur content of less than 1 ppm.

12. (Original) A method according to claim 9, wherein the processing is performed by hydrotreating.

13. (Previously presented) A method of inhibiting oxidation of a Fischer Tropsch product comprising the steps of:

- a) synthesizing a Fischer Tropsch product; and
- b) creating a blended hydrocarbonaceous product by mixing (i) the Fischer Tropsch product, (ii) an effective amount of sulfur-containing petroleum-derived hydrocarbonaceous product, and (iii) an effective amount of an antioxidant selected from the group consisting of phenolic compounds, diphenylamine compounds, and combinations thereof, such that the blended

hydrocarbonaceous product has a final peroxide number of less than 5 ppm after 7 days;
wherein the effective amount of antioxidant in (i) and (ii) is less than the amount that would be required in (i) alone.

14. (Original) A method of inhibiting oxidation of a Fischer Tropsch product according to claim 13, wherein the blended hydrocarbonaceous product has a peroxide number of less than 3 ppm after 7 days.

15. (Original) A method of inhibiting oxidation of a Fischer Tropsch product according to claim 13, wherein the blended hydrocarbonaceous product has a peroxide number of less than 1 ppm after 7 days.

16. (Original) A method according to claim 13, further comprising a step c) processing the blended product with hydrogen to remove at least a portion of sulfur and other impurities that originate from the petroleum-derived hydrocarbonaceous product after the period in which oxidation is to be prevented.

17. (Original) A method according to claim 13, further comprising a step c) hydrotreating the blended product to remove at least a portion of sulfur and other impurities that originate from the petroleum-derived hydrocarbonaceous product after the period in which oxidation is to be prevented.

18. (Previously presented) A blended hydrocarbonaceous product comprising:

- a) a Fischer Tropsch derived product;
- b) an effective amount of sulfur-containing petroleum-derived hydrocarbonaceous product; and
- c) an effective amount of an antioxidant selected from the group consisting of phenolic compounds, diphenylamine compounds, and combinations thereof, such that the blended hydrocarbonaceous product has a final peroxide number of less than 5 ppm;

wherein the effective amount of antioxidant in (a) and (b) is less than the amount that would be required in (a) alone.

19. (Original) A blended hydrocarbonaceous product according to claim 18 wherein the Fischer Tropsch derived product has a branching index of less than five.

20. (Original) A blended hydrocarbonaceous product according to claim 18 wherein the Fischer Tropsch derived product has a branching index of less than three.

21. (Previously presented) A blended hydrocarbonaceous product comprising:

- a) a Fischer Tropsch derived product; and
- b) an effective amount of a sulfur-containing petroleum-derived hydrocarbonaceous product such that the blended hydrocarbonaceous product has a final peroxide number of less than 5 ppm, and has a sulfur content of greater than 1 ppm and less than 100 ppm.

22. (Original) A blended hydrocarbonaceous product according to claim 21 wherein the blended hydrocarbonaceous product has a final peroxide number of less than 3 ppm after 7 days.

23. (Original) A blended hydrocarbonaceous product according to claim 21 wherein the blended hydrocarbonaceous product has a final peroxide number of less than 1 ppm after 7 days.

24. (Original) A blended hydrocarbonaceous product according to claim 21 wherein the Fischer Tropsch derived product has a branching index of less than five.

25. (Original) A blended hydrocarbonaceous product according to claim 21 wherein the Fischer Tropsch derived product has a branching index of less than three.

26. (Previously presented) A blended hydrocarbonaceous product produced by the process of Claim 13, wherein the product comprises:

- a) a Fischer Tropsch derived product;
- b) a sulfur-containing petroleum-derived hydrocarbonaceous product; and
- c) an effective amount of an antioxidant selected from the group consisting of phenolic compounds, diphenylamine compounds, and

combinations thereof, such that the blended hydrocarbonaceous product has a final peroxide number of less than 5 ppm;
wherein the effective amount of antioxidant in (a) and (b) is less than the amount that would be required in (a) alone.

27. (Previously presented) A blended hydrocarbonaceous product produced according to the process of Claim 1, the product comprising:

- a) a Fischer Tropsch derived product; and
- b) an effective amount of a sulfur-containing petroleum-derived hydrocarbonaceous product such that the blended hydrocarbonaceous product has a sulfur content of greater than 1 ppm and less than 100 ppm, and has a final peroxide number of less than 5 ppm.

28. (Previously presented) A blended hydrocarbonaceous product according to claim 21, wherein the sulfur-containing petroleum-derived hydrocarbonaceous product is selected from the group consisting of conventional petroleum, conventional diesel fuel, conventional solvent, conventional jet fuel, conventional naphtha, conventional lube base stock, conventional lube base oil, and mixtures thereof.